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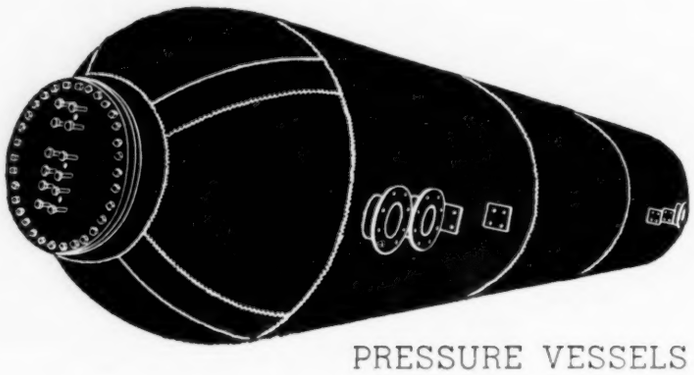
CHROMIUM *the key Metal*

FROM PEN POINTS

TO



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As the Editor Views the News

READERS of STEEL who have been following "Windows of Washington" and this page regularly doubtless have been prepared for the shock which comes with the realization that the extending of the olive branch to industry by the government administration in recent months did not mean that a moratorium on impractical ideas had been declared. The outburst of half-baked proposals—many of them no more important than trial balloons—should not be taken too seriously. If industry gets the jitters from the visionary propositions which have graced the front pages recently, what will they do when congress delivers its quota of wild ideas?

• • •

Caution and Indulgence

While it would be foolish to completely ignore the serious implications of many of the bills which inevitably will be presented at the forthcoming session, industrial executives may well cultivate a philosophy in which the ingredients of justified caution are tempered with a reasonable portion of indulgence. The promise of expanding volume of business in the first half of 1935 will win priority in the competition for the attention of executives during the early months of the year. To capitalize upon the opportunities of the prevailing economic situation is more important than to fear radicalism. Much of the fanaticism of the day will melt under the sun of prosperity.

• • •

What Is Best for Worker?

Think what one will about the tactics employed by A. F. L., everyone will agree it is proficient in the art of propaganda. It is a rare day which does not bring forth a headlined statement or interview by Mr. Green or his associates. In the past week, the hearing on stabilizing conditions in the automobile industry served A. F. L. as the principal medium of expression. The public was told of many cases of low annual incomes derived from work in the industry. With the stage thus set, the union labor leaders trotted out a "program" (p. 8) calculated to remedy these conditions. It calls for a 30-hour week (which means higher hourly rates) and a $1500 minimum annual income. Some day A. F. L. members will learn that a wage that is responsive to demand (p. 19) yields the most satisfactory real income.

• • •

Three Methods —All Feasible

The recovery platform drafted at White Sulphur Springs by the super-committee of N. A. of M. and U. S. C. of C. (p. 11) fared rather badly in the public prints. This is regrettable, because many able men worked hard and sincerely on the document. The trouble is that the committee appealed to the public on the basis of sound reasoning, whereas the public today reacts to emotional appeal. To speak authoritatively for all business interests is a difficult task at best. Perhaps under present conditions the job can be done better by each industry handling its own public relations problems. Even more effective is for each employer to explain his problems to his congressmen. All three methods have their place; each should be used to suit the occasion.

• • •

Science Will Not Be Denied

An engineer and a chemist of the United States bureau of mines have developed an alternating-current magnetic separator (p. 37) which causes magnetized particles of ore to jump away from waste material. The device, which promises to produce a superior concentrate, will be demonstrated at a national meeting of scientists in Pittsburgh this week. . . . Interesting steps in the evolution of the labor-saving and injury-avoiding automatic clay gun are recounted in a description (p. 39) of the latest model. . . . An eastern steelmaker, utilizing a special electrolytic process to solve the age-old problem of obtaining a thick, yet ductile zinc coating for steel, is successfully applying zinc to wire (p. 22) in thicknesses two or three times heavier than by previous methods.

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To all, a Merry Christmas!

E. L. Shaner

Labor Carries Steel Truce Opposition to White House

NATIONAL steel labor relations board and Secretary of Labor Perkins late last week were still working to break the impasse, resulting from an obdurate stand by labor, that was threatening to wreck President Roosevelt's program for a six-month truce on labor in the iron and steel industry.

Last Tuesday, in the White House, the President conferred with representatives of the industry, labor, the labor board, and the department of labor. A three-point formula was proposed:

Employers to bargain with all groups of employes.

Labor and employers to recognize the steel labor relations board as an arbitration agency.

Both sides to agree on a truce for six months during which no elections of representatives for collective bargaining would be held.

What Labor Wants

Voiced by Michael F. Tighe, president of the Amalgamated Association of Iron, Steel and Tin Workers, labor's objections are (1) majority rule must govern, (2) elections should be held, and (3) the formula must be submitted to a referendum of the Amalgamated.

For the present, at least, the onus of delay and obstruction is upon labor. Although no official statement has been made, the presumption is that the formula, which is substantially that proffered by the Carnegie Steel Co. six weeks ago at the time of hearings on labor relations at its Duquesne, Pa., and McDonald, O., plants, is acceptable.

Participating in last week's conferences were Myron Taylor, chairman, and Nathan I. Miller, counsel, of the United States Steel Corp.; Eugene G. Grace, president of the Bethlehem Steel Co. and the American Iron and Steel institute; Tom M. Girdler, chairman and president of Republic Steel Corp.; Earl F. Reed, counsel for the National Steel Corp., Jones & Laughlin Steel Corp. and Wheeling Steel Corp.; Secretary Perkins; Assistant Secretary of Labor Edward F. McGrady; William Green, president of the American Federation of Labor, and Michael F. Tighe, president, and Charlton Ogburn, counsel, of the Amalgamated.

Meanwhile, as suddenly as it had been precipitated, the hearing scheduled for Dec. 19, concerning Clayton Mark & Co., Chicago, was indefinitely postponed on joint request of both employes and the company. It was alleged that the company had refused to recognize the Amalgamated association as the representative for all employes.

At such an election which the steel truce formula would avert and upon which labor is insisting, more than 98 per cent of all employes of the Weirton Steel Co. eligible to cast ballots participated two weeks ago. In the sense that the Amalgamated had no slate and none of the representatives elected professed to membership in it, the Amalgamated sustained a defeat.

Thirty-nine of the 49 representatives who were elected have served in the past year. Results at the three plants of Weirton follow:

Weirton steelworks: Re-elected—N. K. Moore, C. W. Conn, J. Thompson, B. A. Fenske, J. J. Young, and J. Weaver. New—C. Custer, A. Atwell, G. Boback, E. McGinnis, H. Smith, and H. Manley.

Weirton strip steel department: Re-elected—John Larkin, J. Degman, G. Harris, R. B. Buckanan, J. A. McGowan, C. Stillwell, M. Rothbrock, K. Fish, and D. Reider. New—H. Schaefer and D. Ferguson.

Weirton tin plate department: Re-elected—C. Lyons, O. Thomas, M. Waltz, J. Jewett, J. Caughan, William McCarthy, G. Costari, and H. Kirk. New—A. Koper, G. Bush, and C. Cox.

Weirton sheet mill department: Re-elected—Dan Sexton, Howard Henry, and Clarence Nesselroad. New—Howard D. Pearce and John C. Oliver.

Steubenville plant: Re-elected—Fred Bray, George Ferguson, Harry Fray, and Dan Hicks. New—Patsy Della Penna.

Clarksburg plant: Re-elected—C. R. Mason, E. H. Holt, Burl Baughman, Carl Means, and Lloyd McCray.

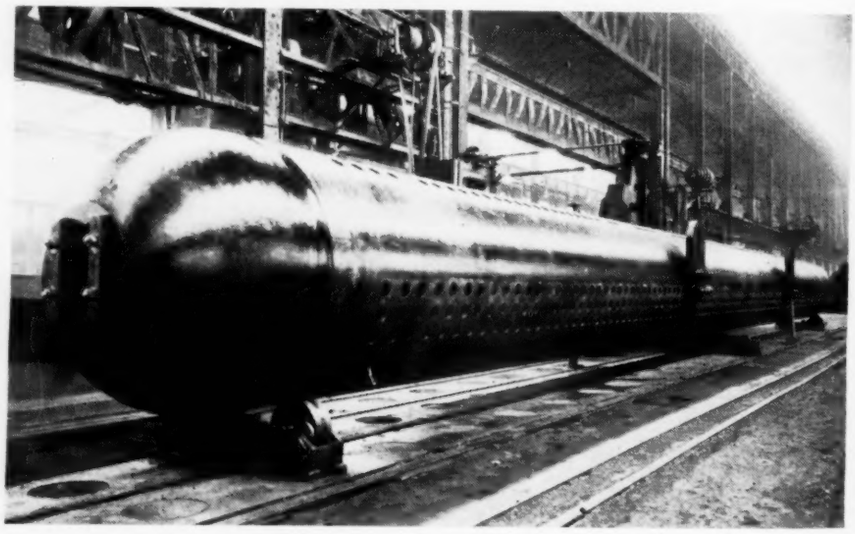
Still Battle at Wilmington

At Wilmington, Del., the department of justice, continuing the suit involving the original election of Weirton employe representatives on Dec. 15, 1933, filed a brief alleging that the company "debauches" its representatives and that its plan is a "gross imposition" upon workers.

At various hearings in the Detroit region last week conducted by the President's special automotive committee, promised when the automobile code was extended unchanged to Feb. 1, labor submitted these demands: A 30-hour week; minimum annual wages ranging from $1500 to $2000 for production employes, and $2500 for tool and die workers; outlawing of the speed-up; a survey to determine the extent of labor displaced by automatic machinery.

BONUS FOR MESTA EMPLOYES

Directors of the Mesta Machine Co., Pittsburgh, last Thursday voted



A ONE-PIECE FORGING: This forged steel boiler drum, made by the Bethlehem Steel Co., for the East Port Washington, Wis., powerhouse of the Milwaukee Electric Railway & Light Co., is 62 feet long, and was forged from a single ingot under a 14,000-ton hydraulic press. The ingot was poured in an 108-inch diameter ingot mold and weighed about 392,000 pounds. Bethlehem forged two drums like the one shown above, and a third that was 59 feet 8 inches long—all said to be the largest of their kind. Photo courtesy the Bethlehem Steel Co.

a one month's salary bonus to each of the 200 employes. This was the first Christmas bonus since 1929 and involves a distribution of approximately $40,000.

¶Colorado Fuel & Iron Co., Denver and Pueblo, Colo., will reopen its Sunrise, Wyo., iron ore mine or mines late in January, re-employing over 100 men.

MUST PAY FOR STRIKE HURTS

A ruling just made by the Indiana appellate court, in which it was held that employers are liable for injuries to their employes suffered when they continue to operate after the premises are "no longer a safe place in which to work" because of picketing, may increase premium rates for compensation insurance, it is feared.

The decision was given in a case in which an employe had sought compensation from his employer for injuries sustained during an altercation with union pickets. The case was taken to the state industrial board and that body held that the employe was not entitled to compensation. He appealed to the appellate court, which reversed the decision of the industrial board.

Structural Code

ADVISORY council of NRA Friday completed its conferences in connection with the structural steel code, and will now report direct to the national industrial recovery board. The matter has been pending before the council for several weeks.

While no official statement has been made, it is understood that the council will suggest to the board that a mediator be appointed, and three plans will be outlined for him to follow in his conferences with industry. Due to the holiday, neither the advisory council nor the recovery board will meet until after Jan. 1.

The code was promulgated in July, but fabricators have refused to accept it because control over erection was lodged in the construction code.

PWA

LAST week the Pennsylvania railroad rolled out of its shops the last of the 7000 freight cars it has been building as part of the PWA program to create employment.

For this project the Pennsylvania borrowed $17,000,000 from the government. It also borrowed $45,000,000 for electrification work now nearing completion, $15,000,000 for 100 electric locomotives now under construction, and $3,650,000 for 100,000 tons of rails which were rolled last summer.

For the freight cars, the Pennsylvania expended $3,503,976 for rolled steel, $6,429,382 for foundry and machine shop products not otherwise classified; iron and steel forgings, $9158; steel springs, $399,821; bolts, nuts, washers, etc., $254,470; cast iron pipe and fittings, $14,044; nails and spikes, $3169; metal doors, etc., $269,339; sheet metal work, $316,493; tools, other than machine tools, $17,859.

Basing Point

REPRESENTATIVES of the federal trade commission and NRA conferred Friday in connection with steel basing point report asked by the President. All present members of the commission participated, in addition to experts. It is reported that certain matters were referred back to the experts of both NRA and the trade commission, but unless there are new developments no further joint meetings will be necessary.

The trade commission has not and will not withdraw the report which it has already made to the President, which leads to the conclusion that the commission is standing pat.

Members of the trade commission sitting in on the conference included Commissioners Ferguson, Davis and March. Other representatives of the commission included Eugene W. Burr and Walter B. Wooden, lawyers; Hugh E. White, economist; and William T. Kelley, chief counsel and chief economist; NRA representatives included Blackwell Smith, acting chief counsel; Leon Henderson; Deputy Administrator R. W. Shannon; B. T. Ansell, legal division; Prof. John M. Clark, and Wade P. Ellis, deputy administrator.

New Capacity

BETHLEHEM STEEL CORP. will spend $25,000,000 for plant improvements and replacements in 1935, James A. Moffett, federal housing administrator, announced Friday. American Radiator & Standard Sanitary Corp. has scheduled $5,000,000 for this purpose. In addition to the Standard Oil Co. of New Jersey, which is to spend $70,000,000 for betterments, two other oil companies indicate they will appropriate a total of $67,000,000. Last week Mr. Moffett announced (STEEL, Dec. 17, p. 14) that the United States Steel Corp. will put $40,000,000 into its properties next year.

¶Ford Motor Co., Dearborn, Mich., plans to install new gas cleaning equipment and other subsidiary equipment, costing $820,500, as part of its general iron and steel works expansion program.

¶Algoma Steel Corp., Sault Ste. Marie, Ont., will install several bell-type electric furnaces.

Outlook for 1935

THE volume of electrical manufacturing business during 1934 has been more than 30 per cent greater than in 1933. Consumption of electricity throughout the United States has been approximately 7 per cent greater than in 1933 and is almost up to the maximum consumption in

OVER THE HILLS FROM HETCH HETCHY reservoir, in the Sierra Nevada mountains, these pipes of fabricated steel plates resting on concrete supports carry an enlarged water supply for San Francisco. On its 167-mile journey this water is put to work developing electricity, this scene being taken near the Moccasin creek generating station. Acme photo

the years 1929 and 1930. This increase has been due largely to the increased use of electrical appliances in the home. The electrical manufacturing industry, and industry in general, has felt most seriously the failure of the revival of orders for capital goods, but with the increased use of electricity and consumers' goods in general, capital goods must also increase. For the year 1935, we look forward to a continued improvement in business."—Gerard Swope, president, General Electric Co.

NATIONAL OUTLOOK GOOD

"Our operating rate has been moving upward steadily and I look for some further improvement. January and February should be as good or better than December, and I am hopful of a marked improvement by March. National Steel Corp.'s results in the final quarter of 1934 should be substantially better than in the previous quarter. The company's operating rate currently is around 60 per cent."—Ernest T. Weir, chairman, National Steel Corp.

Washington

SIMPLIFIED practice recommendations for wire insect screen cloth, originally effective Nov. 1, 1931, and on roofing ternes originally effective Jan. 1, 1928, have been reaffirmed without change.

¶A proposed revision of the simplified practice recommendation on forged tools originally effective July 1, 1924, and subsequently revised on April 1, 1927, and July 1, 1931, is being distributed.

Meetings

CHICAGO chapter of American Society for Metals will celebrate its annual national president's night at the Medinah club, Chicago, Jan. 10, with B. F. Shepherd, president of the society, and W. H. Eisenman, national secretary, as guests.

ALLOT TOOL CONVENTION SPACE

First allotment of space at the machine tool exposition of the National Machine Tool Builders' association, 1220 Guarantee Title building, Cleveland, to be held in Cleveland public auditorium next September, will be made Jan. 5. W. P. Kirk is chairman of the exposition committee.

¶Fifth Packaging exposition will be held at the Palmer House, Chicago, March 5-8, 1935, according to A. E. Dodd, executive vice president of the American Management association, New York, which sponsors the exposition. Equipment, machinery, materials, supplies and services involved in packaging, packing and shipping will be shown.

Transportation

JONES & LAUGHLIN Steel Corp., a pioneer in the shipment of steel over the Ohio river by barge, is sending out its 200th tow from the Pittsburgh harbor this week. Barges being loaded up until late last week at the Southside, Pittsburgh, and Aliquippa, Pa., plants of the company will carry steel for delivery to Memphis, Tenn., New Orleans and intermediate ports.

Jones & Laughlin's river record in sending out its 200th tow brings to mind the ceremony attending Carnegie Steel Co.'s 100th tow of a similar nature which STEEL reported Feb. 5, 1934, but, unlike Carnegie's 100th tow, which featured a calliope, Jones & Laughlin's tow will sail forth without any great ado.

ARGUE VALLEY COAL RATE

Through last week argument was proceeding before the Supreme Court at Washington on the river-rail rate for bituminous coal moving from Conway, Pa., and Colona, Pa., on the Ohio river to Youngstown, O. Youngstown Sheet & Tube Co., Republic Steel Corp., Sharon Steel Hoop Co. and others have attacked the order of the interstate commerce commission for setting a 90-cent per ton rate on this movement.

Originally, the rate had been $1.02, which was attacked by the Mahoning valley steel companies as giving a preference to the Pittsburgh and Wheeling district steel producers who could receive coal by water. Thereupon the ICC established a 77-cent per ton rate, which in turn was attacked by the Baltimore & Ohio and other railroads as being too low. Thereupon the commission ordered the present 90-cent rate which is under criticism.

Financial

REPORTS in Pittsburgh financial circles last week credited a reorganization of Follansbee Bros. Co., in receivership since last summer, as being under way. The company has been operated in the interim jointly by three receivers. Follansbee bonds and common and preferred shares featured an unusual turnover at higher levels on the Pittsburgh stock stock exchange last week.

DIVIDENDS DECLARED

Western Pipe & Foundry Co., Los Angeles, 25 cents on common stock Dec. 22 to record of Dec. 15. Last previous payment was 25 cents in December, 1932.

Detroit Gray Iron Foundry Co., Detroit, 10 cents on common stock Dec. 20 to record of Dec. 15. Last previous payment was 25 cents on Dec. 18, 1931.

Aluminum Co. of America, Pittsburgh, 25 cents a share against the preferred accumulation ($11.75 on Jan. 1) in addition to the 37½ cents it has been paying quarterly. Last full quarterly preferred dividend was paid in 1932.

Washington Tin Plate Co., Washington, Pa., which has been paying a regular dividend of $1.50 quarterly on each of its 15,000 outstanding shares of capital stock, an extra of $2 a share. The company earned $7.68 a share in 1933 and has paid dividends at the annual rate of $6 per share for the past four years.

Gardner-Denver Co., Quincy, Ill., 25 cents Jan. 1 to record of Dec. 20.

Thompson Products Inc., Cleveland, four quarterly payments of $1.75 each on the preferred, cleaning up all arrears but the last three quarters of this year.

Link-Belt Co., Chicago, quarterly payment of 15 cents a common share payable March 15 to record of Feb. 15.

Edgewater Steel Co., Pittsburgh, an extra of 30 cents a share on the capital stock paid Dec. 19 to Dec. 17 record. This stock has been on a $2.50 annual dividend basis, payable in monthly installments.

TO ISSUE $500,000 IN BONDS

Pennsylvania Engineering Works, New Castle, Pa., will issue $500,000 of first mortgage, 6 per cent, 5-year bonds at $95 per $100 face value, according to registration pending with the securities and exchange commission. Proceeds are to be used to liquidate current indebtedness, bank and trade notes and for working capital.

¶A. M. Byers & Co., Pittsburgh, reports third quarter net loss of $258,157 compared with net loss of $167,563 in the preceding quarter.

¶Colorado Fuel & Iron Co., Denver and Pueblo, Colo., is reported planning to pay the interest on its general mortgage 5 per cent bonds on Feb. 1.

¶Edward G. Budd Mfg. Co., Philadelphia, is asking stockholders to approve issuing 500,000 additional common shares, to a total of 1,600,000.

WOULD EXCHANGE DEBENTURES

Dominion Steel & Coal Corp., Montreal, Que., will submit to holders of its 6 per cent debentures and bonds a proposal for distribution to them of 6 per cent cumulative sinking fund debentures of the Dominion Coal Co. Ltd., to the extent of 50 per cent of the debentures they now hold, and the 6¼ per cent cumulative participating income bonds of the Dominion Steel & Coal Corp. Ltd., to 64 per cent of the par value of these debentures.

NRA

BEGINNING Jan. 9 in Washington the national industrial recovery board will open hearings to collect evidence on the operation of major code provisions and the advisability of amendment or continuation. Price control and price fixing will be the subject of the first hearing.

According to S. Clay Williams, chairman of the board, the preponderance of evidence and opinion on the subject of price control is adverse to it. Information derived from the hearings will probably be the basis of a recommendation to congress when it considers the present recovery act, which expires June 16.

PROPOSED CODE AMENDMENTS

To the conveyor manufacturing code: That all second-hand equipment more than five years old traded in on new equipment be destroyed and the seller of new machinery remove from the premises of the purchaser all other traded in machinery within 30 days.

To the wire, rod, and tube die industry code: That employes be permitted to work up to 44 hours a week during peak seasons.

To the machine screw manufacturing code: Regulating the practice of hedging. Contracts at a specified price for an unspecified quantity for delivery during a certain period will be prohibited unless the contract is for a fixed percentage of the total requirements of the purchaser.

MEET ON WASHER CODE DEC. 28

The code authority for the wrought washer industry has notified interested parties of a hearing for approval of this industry's code to be held at Washington, Dec. 28. H. Ferris White is deputy administrator.

Institute

AMERICAN Iron and Steel Institute has issued freight tariff No. 3 covering all-rail rates from basing points to consuming points in the South. The territory covered includes Alabama; Florida; Georgia, southern territory of Kentucky, Louisiana, east of the Mississippi river; Mississippi, including Helena, Ark.; North Carolina, South Carolina, Tennessee and the southern section of Virginia.

EQUALIZATION IS CONTINUED

Under a new commercial resolution, No. A29, certain deductions from base prices for pig iron at Chicago, as outlined originally under Resolution No. 47, which No. A29 now supersedes, will continue in effect indefinitely.

These deductions may be up to $2 a gross ton, on shipments for delivery at places where the delivered price would be determined from Granite City, Ill., if a base price at Granite City equal to the lowest published base price on such iron then in effect at Chicago, were on file.

Under the new resolution they will be permitted until otherwise determined by the Institute or until one or more base prices at Granite City, as a basing point, shall have been filed.

DEMANDS STORAGE PACTS

Commercial Resolution No. A33, also now effective, provides for a written agreement which has the approval of the Institute board before an arrangement may become effective whereby a code member, directly or indirectly, leases storage space from a purchaser or prospective purchaser, other than an affiliated company; also it provides that each member shall file a true copy of every agreement of this character made prior to Dec. 13 and which shall continue in effect on Jan. 15, 1935.

WAY TO COMPUTE DAMAGES

Commercial Resolution No. A34, recently adopted, provides that if any code member sells two or more products to the same purchaser under the same contract or order or different contracts or orders made or placed at the same time or as part of the same general transaction and such seller violates any provision of Article VII or Schedule E of the code, then, for the purpose of determining the amount of liquidated damages payable, all of the products thus sold shall be deemed as sold in violation.

Foreign

TRADE opportunities abroad, available through bureau of foreign and domestic commerce, Washington, include inquiries from Vienna for 1000 tons of coke, 1000 tons of charcoal pig iron, 500 tons of scrap steel, 300 tons of hot and cold rolled sheets; from Santa Cruz de Tenerife, Canary Islands, for galvanized wire, pipe, rods, bars, and cut and wire nails; from Yokohoma and Palestine for tin plate; from Glasgow for papermaking wire and from Syria for 600 tons of soft steel wire.

EDUCATE ON ALUMINUM

German aluminum manufacturers, in a merchandising and educational campaign, are offering a 10-day course for 12 reichmarks (about $5) designed to teach a mechanic, foreman or manufacturer all he needs to know about aluminum and its alloys in shop use. Material for practical work is supplied by the aluminum industry. This program is supplementing lectures, exhibitions, pamphlets and newspaper articles.

Industry Adopts Recovery Program

MEETING last week at White Sulphur Springs, W. Va., leading industrialists adopted a recovery program proposing:

Industrial relations. Arbitrary determination and limitation of hours and wages are harmful. There should be no attempt to lessen through legislative restrictions the freedom of employes to determine the form of any organization for the purpose of collective bargaining. Sympathetic or general strikes, black lists and boycotts should be prohibited.

Durable goods. The chief needs to stimulate these industries are (1) a free flow of private capital into private business. (2) a sound real estate mortgage market. (3) low construction costs necessitating removal of artificial restraints curtailing volume and increasing costs, both of labor and material.

Government competition. It is destructive, small business is first to suffer, and the government should cease competing in more than 20 different kinds of business.

Labor provisions of NRA codes. Any new legislation continuing the recovery act should be of the same temporary character as the present act and limited to one year. The new act should require every code to contain provisions for maximum hours, minimum wages, prohibition of child labor, safeguarding of right to bargain collectively.

Foreign trade. Its recovery requires (1) establishment of stable world monetary standards, with reconsideration of government debts due the United States; (2) co-operation with foreign nations to remove quotas; (3) negotiation of reciprocal trade agreements with foreign countries; (4) recognition of the fact that increase of domestic production costs lessens ability to compete in foreign markets; (5) co-operation with export-import banks.

Federal financing. By restricting emergency relief expenditures further increase in the public debt after next June 30 can be avoided and the budget balanced in 1937.

Unemployment reserves. A desirable objective, but requiring careful study before consummation. A committee should be set up to study practicability of a comprehensive program of social security adapted to American conditions.

Relief. Should be a function of local government. Employment on useful public construction projects is preferable to idleness.

Business financing. Banks should

be privately owned and managed and issuance of securities freed from unwarranted government supervision.

Transportation. Maximum efficiency demands freedom for development in each field. Prudent federal loans to carriers are desirable.

NIRA. Should be continued for one year in accordance with stand on labor provisions of codes and competitive practice provisions.

Competitive practice provisions. Voluntary submission to trade practice provisions should be made possible.

Production

STEELMAKING operations jumped 4 points to 37½ per cent last week, when every district except Detroit, which was stationary, and Birmingham, report improvement. Christmas this year will be only a one-day holiday for most producers, and the increase in specifications which prompted last week's rise will practically offset the shutdown. Details for districts follow:

Youngstown—Up 5 points last week to 44 per cent, and starting this week at that rate. Continuous operations on Sunday at some works offset the Christmas holiday. Carnegie Steel Co. has resumed melting at an Ohio works stack.

Pittsburgh—Rose 2 points to 26 per cent last week, the fourth successive weekly advance. The two leading interests operated last week at 27 and 28 per cent, respectively. Some of the smaller independent producers operated at as high as 50 per cent.

For this week, operations probably will undergo little interruption over the Christmas holiday. Most producers are simply planning to close some departments for Dec. 25 only.

Twelve out of 60 steelworks blast furnaces are now operating in this district, and this total will be increased shortly. National Tube Co. last week blew in one Monongahela stack on bessemer iron, and at least three other district steelmakers are planning to resume with additional blast furnaces this week or next.

Carnegie Steel Co. has 6 of 32 furnaces in blast, Jones & Laughlin Steel Corp., 2 of 11; Pittsburgh Crucible Steel Co. and Pittsburgh Steel Co., 1 of 2 each, and Bethlehem Steel Co., 1 of 7. Though the National Tube Co.'s blast furnace resumed at the Monongahela works last week, the first iron will be tapped Dec. 26.

Central eastern seaboard—Following a rise last week of 2½ points to 22 per cent, steelmaking operations are scheduled to take a dip this week in view of the holidays. Finishing departments at most plants were closed down Dec. 22 until Dec. 26, and open-hearth furnaces were placed at low temperatures, precluding production for the same period. Steelmaking at at least one plant has been suspended until after Jan. 1, but this is exceptional. Improvement in steelmaking last week was attributed not only to plans for partial suspension during the holidays, but also to maintenance of spot specifications, which prevailed almost up to the close of the week, exceeding the expectations of most producers in this respect.

Wheeling—Up 10 points to 80 per cent last week, as three additional open-hearth furnaces were added to the active list. Twenty-nine open-hearth furnaces are now active out of 37, with two out of the four works entering into the Wheeling district average, at virtual capacity. Weirton Steel Co. has blown in an additional blast furnace and is planning to schedule a resumption of tin plate operations at its Clarksburg, W. Va., works on Dec. 26, after some months of inactivity.

Sheet and tin plate activity in the Wheeling district is accounting for a large share of the improvement in steel ingot operations. One district tin mill recently put on 20 of its 26 hot mills and another district tin plate producer last week had 25 hot mills on all 16 turns.

Chicago—Increased almost 1 point to slightly over 36 per cent, against 35½ per cent a week ago. While the holiday will curtail operations this week, one mill plans a sharp increase in open-hearth operations Wednesday and a further gain in the average rate is likely to develop. Steelworks continue to operate nine of 36 blast furnaces.

Cleveland-Lorain—Up 5 points to 64 per cent. National Tube Co., Lorain, and Corrigan, McKinney Steel Co. each operated 10 open hearths; Otis Steel Co. lighted a sixth unit Friday. These operations are scheduled for this week, except Christmas. Bar mills last week averaged 50 per cent; sheet mills 75 to 85 per cent; strip 65 per cent; plate 25 per cent.

New England—Up 3 points to a fraction above 50 per cent last week. Despite the holiday this week, but slight loss in operating schedules is expected.

Buffalo—Advanced 13 points last week to 37 per cent, surpassing the previous high record since the second week in August by 3 points. A flow of orders from automotive sources is responsible for the quick upturn. Plans to close open-hearth operations for a long holiday at Christmas have been abandoned in favor of a shutdown of not more than three days, as a result of the improvement in business. Fourteen open hearths were in production last week, and indications are that this number will go back into operation after the brief holiday.

Birmingham—Dipped 2½ points last week to 30 per cent, with five open hearths continuing in operation at Fairfield and two or three at Gadsden. Operation of the rail mill at Ensley by the Tennessee Coal, Iron & Railroad Co. for ten days melted a large quantity of steel.

Detroit—Held at 59 per cent last week, one producer still continuing to operate all eight open hearths and another melting in only two.

WILL REOPEN RAIL MILL

Colorado Fuel & Iron Co. reopened its pipe mill at Pueblo, Dec. 17, giving employment to 125 men and is preparing to resume operations in its rail mill Jan. 7, opening up employment to several hundred men. Present orders on the books will keep it running for some time.

NOVEMBER SHEET DATA UP

Daily average sheet steel sales, production and shipments in November increased over October, according to the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. Sales, 4444 net tons compared with 3320 tons; production, 4768 tons, up from 3384 tons; and shipments, 3629 tons, against 3068 in October. November totals: Sales 133,344 tons; production, 143,057 tons; shipments, 108,880 tons. Total sheet capacity in this country for November was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

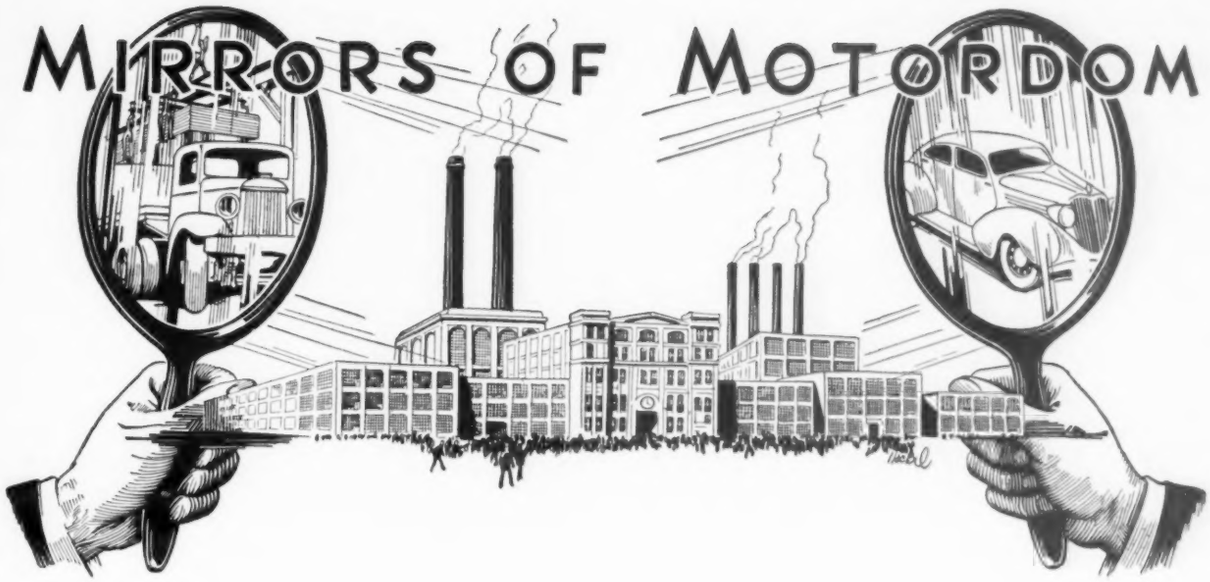
TIN PLATE OUTPUT UP SHARPLY

Production of tin plate and terne plate in the United States in 1933 increased 21.3 per cent in quantity and 5.5 per cent in value over 1931, according to the census of manufactures, Washington. The 32 establishments in business last year made 3,962,856,035 pounds valued at $148,770,839. Comparisons follow:

	1933	1931
No. of establishments	32	31
Production:		
Total pounds	3,962,856,085	3,268,025,278
Total value	$148,770,839	$140,984,351
Tin plate—		
Total pounds	3,764,602,348	3,108,668,090
Total value	$142,434,487	$135,374,970
Coke plate—		
Pounds	3,744,304,436	3,071,029,750
Value	$141,452,854	$133,193,780
Charcoal plate—		
Pounds	20,297,912	37,638,340
Value	$981,633	$2,181,190
Terne plate, including long terne—		
Pounds	198,253,737	159,357,188
Value	$6,336,352	$5,609,381

Imports

IMPORTS of iron and steel into the United States in November totaled 35,272 tons, highest tonnage since March, and were a gain of 75 per cent over October. For 11 months of this year imports were 297,053 tons, compared with 383,262 tons in the comparable period of 1933.



DETROIT

NEXT SATURDAY—Dec. 29—the new Fords will make their official debut. Most striking of the changes will be the **accentuated** beavertail rear of all models and, in the case of 4-door jobs, the treatment of the body.

To make the front seat comfortable for three, a decided **flare begins** at the cowl, narrowing the running board to only several inches where it joins the rear fender. The rear quarters will extend out over half of the rear fender, and there will not only be a decided bulge from the cowl to the rear in a horizontal plane but also a prominent flare from roof to running board.

ONE MILE PER HORSEPOWER

Both front and rear doors will be hinged in the center. At least in the deluxe 4-door models, the rear door handle will be so far to the rear as to be just above the center of the rear fender. Ford tops will be all-steel. Wheelbase will be unchanged but rearrangement of engine and body will provide 6½ inches more length to the body interior in sedan models.

The principal change in the engine will be that noted last week for the truck—a direct-flow crankcase ventilation system. Engine horsepower is reported to have been increased to 100 and top speed of the car also to 100 miles per hour; thus the Ford may be featured as a "one mile per horsepower" car.

PONTIAC, as previously reported will offer two sixes—deluxe and standard models—on the same wheel base, in addition to the eight. All three follow Oldsmobile's lead among General Motors units in adopting hydraulic brakes.

Devoid of knee-action coil springs and certain body refinements found on other models, the standard six line will appeal to the economy buyer. Changes effected in appearance of the new Pontiac eight indicate that it will share the limelight with Oldsmobile as a style leader for GM.

The Pontiac radiator is narrow, similar to the LaSalle design, but slanting at a moderately greater angle. Part of the radiator grille extends back over the hood to the slanting windshield, which is divided by a bright-metal strip and has a slight V. Bendix hydraulic brakes are employed, the front drums being double-sealed and the rear drums triple-sealed to exclude water and dust. The motor is provided with automatic choke and cadmium-silver bearings.

Sedan bodies equipped with a trunk have the tail light mounted on the trunk panel which, when opened, raises the light almost to a level with the top of the car. This is an aid in preventing accidents when the tail light is obscured by someone working on the spare tire. The spare fits in the body underneath the trunk floor. Knee-action coil springs are entirely enclosed on both the eight and deluxe six.

SIX-CYLINDER Pontiac models have a design similar to the eight, are 4½ inches shorter in wheelbase and also have hydraulic brakes. Motors of the six and the eight bear close resemblance except for the difference in number of cylinders, while crankshaft design of the former results in little more motor vibration than in the larger car. There is also only a small difference in top speed between the two. Orders placed during the recent gathering of dealers at Pontiac to view the new models totaled nearly 33,000 units, about 20 weeks' production at last July's rate.

BUYERS DETERMINE TRENDS

Pontiac's president, H. J. Klingler, recently made a sound observation in pointing out that the depression has exerted an important influence on motor car design in the low-priced market. When economic necessity converted 80 to 90 per cent of the entire car-buying public into customers for cheaper cars, it stimulated manufacturers to satisfy the demands of this transformed market, he stated, adding that the maximum popularity of the low-priced car is still ahead.

PRIVATE showing of the new Dodge last week disclosed a model that in the treatment of the radiator shell is reminiscent both of Oldsmobile and LaSalle — the former through the styling of the shell it-

Automobile Production

Passenger Cars and Trucks—U. S. Only

By Department of Commerce

	1932	1933	1934
Jan.	119,344	128,825	156,907
Feb.	117,418	105,447	231,707
March	118,959	115,272	331,263
April	148,326	176,432	354,745
May	184,295	214,411	331,641
June	183,106	249,727	308,051
July	109,143	229,357	266,575
Aug.	90,325	232,855	234,809
Sept.	84,150	191,800	168,872
Oct.	48,702	134,683	132,448
Nov.	59,557	60,683	85,000*
Year to date	1,263,325	1,839,492	2,712,084

*Estimated.

Estimated by Cram's Reports

Week Ended

Dec. 1	11,389
Dec. 8	19,347
Dec. 15	24,851
Dec. 22	34,197

self and the latter through its narrowness.

This series, with other Chrysler airstream models, features a rather high valley between the fenders and the hood. Dodge is going to talk a great deal of its "air glide ride," its "synchromatic control" and its "red ram" engine.

Oldsmobile, like some other General Motors lines, will feature the solid steel "turret top" body by Fisher. It is retaining knee-action wheels and the hydraulic brakes which last year made the first dent in General Motors' time-honored adherence to mechanical brakes.

Incidentally, production of this "turret top" requires presses weighing 400 tons and located in pits 25 feet deep; these presses extend 35 feet above the ground and exert a pressure of 750 tons through dies weighing 36 to 64 tons.

The Olds six for 1935 will have a wheelbase of 115 inches, compared with 114 this year, while the eight will be 121 inches, an increase of 2 inches. Engines in both models will be identical with the 1934 lines in bore, stroke, piston displacement and horsepower.

Packard's bid for a share of the business below the luxury field is awaited with considerable interest. While not yet in volume production of its new low-price car, models will be displayed at the New York show next month. Like some other companies which have attempted to invade lower-price fields, Packard has had difficulty in reconciling its usual standards of quality with prices necessary for it to produce a car in the more popular class.

WHILE introduction of new models and rising operations overshadow other developments in the industry, the labor problem occasionally rears its head.

American Federation of Labor and the national automobile labor board, appointed early this year by President Roosevelt, are at odds over the plan for election of worker-representatives to bargain collectively with employers, particularly with regard to the proportionate representation feature.

Union members have been instructed by their leaders not to participate in plant elections sponsored by the board, the first of which is to be held at the Cadillac plant, nominating and final balloting having been scheduled for Dec. 19 and 28, respectively.

ASK ONLY $2500 ANNUALLY

The tool and die workers' union has presented recommendations to the national labor board calling for annual wages of $2500, minimum wages of $2000 for production workers, elimination of the industrial speedup, institution of a 30-hour week without emergency provisions, and a check on automotive machinery's elimination of labor.

In the meantime a staff of 50 government investigators is being maintained at various automotive centers, inquiring into different phases of the industry and hearing grievances and suggestions for improved working conditions. The principal aim of the inquiry is to arrive at a way to smooth out the production curve.

The labor question in general is not considered a critical one at this time, and with employment steadily rising, the unions face an increasingly difficult task in attempting to stir up discontent. February will see the expiration of the automobile code, which was extended in November for three months, and will probably mark the next focal point for attack by the union group.

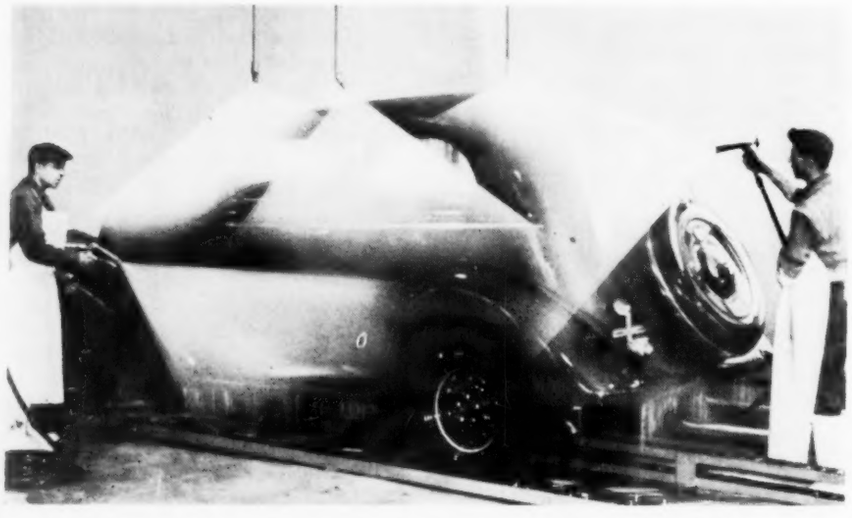
TO ALL appearances the automobile industry is getting off to a flying start in its drive for 1935 business—if the comparison is made with conditions one or two years ago. The problem today is one of attaining sufficient production to provide all dealers with new models, now that the obstacle of unsold stocks of 1934 cars has been removed. With one or two exceptions, old stocks are low for this period.

While difficulties common to the manufacture of a new product have been encountered at some plants and time will be required to effect smooth-working assembly lines at the pace desired, steady progress is being made toward the attainment of projected schedules. Lack of radical innovations in the designs of new models is helping to increase operations. This is in contrast to the situation a year ago when coil springs and airflow bodies plagued General Motors and Chrysler.

Last week production for the industry as a whole was approximately 34,000 units, a gain of 10,000 over the week preceding. This is the third consecutive week of improvement, and last week's rate was triple that of the low point, which was the week ended Dec. 1.

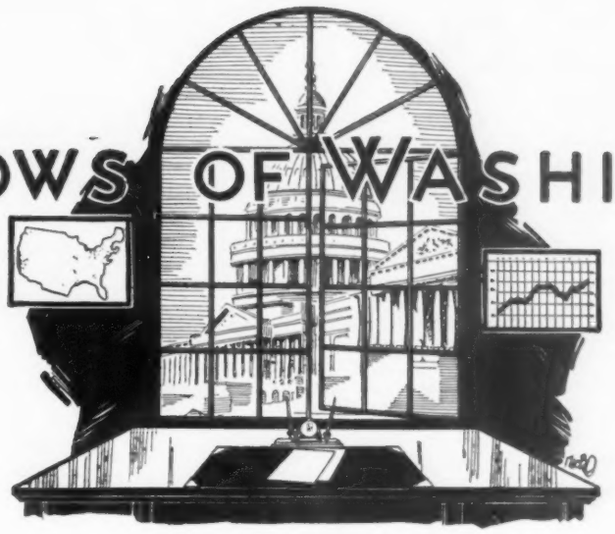
According to *Cram's Reports*, Ford last week assembled 7230 units, against 2000 commercial and 1000 passenger units the week before. General Motors' output was up to 4840 and Chrysler to 15,630. This high Chrysler rate is due in large measure to Plymouth, which is now being assembled at a daily rate of 1600.

Graham in 1935 will again feature a supercharger . . . . Hupp is shortening and lightening its chassis . . . . Incidentally, there are reports that Hupp dealers may also sell the Willys, 15,000 of which have been authorized by federal court . . . . Chevrolet is going to push its standard line hard in 1935; this line has conventional semi-elliptic springs, which make it directly competitive in this respect with Plymouth and Terraplane . . . . Some cars in 1935 will use a shield to protect the carburetor and fuel line from excessive engine heat. . . . Plymouth prices range from $565 to $685; conventional DeSoto models from $695 to $825. The airflow DeSoto has been increased from $995 to $1195.



AN AUTO SHOWER BATH: A new car service department will insure uniform inspection, conditioning and servicing of Chrysler and DeSoto cars before they leave the factory, D. A. Wallace, vice president in charge of manufacturing of these lines, claims. Every operation is checked, the engine cleaned by pressure washers, wiring and oil lines inspected, and cars made ready to turn over to buyers without any servicing by dealers. Next to last step in the process is the water test, shown above. Mechanics spray water under high pressure against the top and sides of the car to make sure there are no leaks. This ordeal successfully negotiated, the cars are polished with high-cycle electric polishers, interiors vacuum cleaned, and they are ready for shipment. The car shown is a 1935 DeSoto

WINDOWS OF WASHINGTON



WASHINGTON

AMONG other things, that new amendment to the constitution convening congress each January instead of December is wrecking the holiday season for practically everybody connected with the government.

Under the old order, congress would have assembled Dec. 3 for the "lame duck" session, and by this time the President's message would be history, congress would be fully organized, committees would be holding hearings, and Washington could be evacuated for the holidays with few uncertainties to mar them.

But not so this year. Not until a week from Thursday—Jan. 3—will congress gather. This means that jockeying for organization posts and committee assignments and chairmanships is still under way, the President's message is still a speculation, the various shades of political and economic thought are still trying to reach the President to color his views—no one can be absolutely certain of anything.

PLANS DELUGE PRESIDENT

Look at developments the past week. It is just as the President is starting to do really serious thinking on his message that the committee on national resources deposits on his desk its voluminous report urging a 20-year hundred billion dollar program, which makes the Russians look like pikers with their 5-year plans.

Down at White Sulphur Springs leading industrialists have been in a huddle on a platform which, it contends, congress should adopt for business. For several months organized labor has shunned the White House, miffed because Secretary Roper and Donald Richberg have made friendly gestures toward business, but last week William Green, president of A. F. L., swallowed his pride and personally left at the White House labor's formula for the new NRA.

Every few days Railroad Co-ordinator Eastman springs a new idea on co-ordination of all transportation agencies, freight car pools and similar subjects. The committee on economic security lets it be known that its plan for stabilizing purchasing power is almost ready. The federal reserve board is talking of ways and means for putting out more money, cheaply, into industry.

TRY TO OIL LABOR FRICTION

And by no means least, important steel executives were at the White House last week in another attempt to deliver a steel labor truce. In event such a truce can be worked out, and there are a good many doubts concerning it in Washington, some of the sting might be taken out of labor legislation and Senator Wagner might be stymied in his determination to stamp out what he mistakenly calls company unions.

Incidentally, the position of the steel industry at the White House has been growing stronger. The record shows that the industry has had many conferences with the steel labor relations board and department of labor officials in regard to recognizing outside unions to the extent of their strength, and labor appears in a truculent, obstructionary role of demanding majority rule and elections.

A good many are eager for an insight into the President's forthcoming message to congress, for whatever indication it will give of a trend to the right or left. Chances are it will lean on the conservative side, so far as any angles pertain to iron and steel.

An NRA minus price provisions is a foregone conclusion. The 8-hour day and 40-hour week are something the industry is already accustomed to. The gesture toward recognizing unions has been made. Unemployment insurance, which the President surely will recommend, is being generally accepted.

In event radicals push their pension plan, steel will probably drop its own individual programs. The power and utility fight of the President will mean the purchase of more equipment, if anything. Iron and steel will sink or swim with the rest of industry according to whatever develops in the matter of currency values and balancing the budget.

It will probably be the case that the President's message will by no means give a complete, or at least a detailed, statement of his program. His method is to send his bills and covering statements of policy to congress one at a time.

TWO developments of the past week have crystallized fears in some quarters that the President is veering again toward the left. These are the renewal of his feud—or more correctly, a continuation of it—with public utility interests, and the 20-year hundred billion dollar national resources program.

PLANTS WOULD NEED STEEL

As a matter of fact, if there is any obsession in Mr. Roosevelt's career it is his belief that public utility rates, especially those for electricity, are excessive. From his earliest days in the New York legislature he has pursued his course undeviatingly. As previously mentioned, any tangible results of his feud would lead to the construction of publicly-owned power plants, which means equipment and, in turn, spirited demand for iron and steel.

So far as the 20-year program is concerned, Washington is not excited over it. In the main, it proposes that the government pursue functions normally accredited to it, such as control of soil erosion and floods, elimination of marginal lands, making available large areas for recreation

purposes, and systematic development of water resources.

In the proposed control of mineral resources, iron ore is not mentioned specifically although it logically falls into this category. In most quarters in Washington the program is regarded as a beautiful dream. As a matter of fact, in normal years private enterprise puts something like twenty billions into development.

Notwithstanding these two developments, the outlook still is that the President will appear at least in the center in the Washington picture and possibly a little to the right of it. The Washington picture, it must be remembered, will be framed by a fringe of radicals and, relatively speaking, the administration's policies will appear a light pink, compared with the reddish hue of the left wing in congress. What has happened, of course, is that the public has become accustomed to many policies.

COTTON growers in the South voted 10 to 1 a week ago Friday on continuing the compulsory acreage limitation features of the Bankhead act. This greatly strengthens the position of the administration in regard to enforced planning . . . . One of the biggest fights in congress looms over the proposal of Co-ordinator Eastman to bring regulation of trucks and buses within the scope of the interstate commerce commission. Truck operators are almost a unit in opposing the recommendation . . . . Hopes for a successful ending to negotiations with Soviet Russia on debts, preparatory to resumption of trading, mount higher. Incidentally, General Electric Co. exceeded its guarantees for efficiency of the five hydroelectric generators installed at Dnieprostroy, and it is believed to be the first foreign purveyor to Russia to exceed its guarantee and earn a bonus . . . . Tennessee Valley Authority has opened branch headquarters in Birmingham, Ala., to accommodate engineers and purchasing officials on TVA contracts, including the purchase of structural steel and reinforcing bars. . . . The new market research and service division of the bureau of foreign and domestic commerce will compile a list of the names and addresses of all trade associations, estimated at 3500 . . . . At least one large steel company is actively figuring on connecting with the housing administration and working out with it a program for replacing its company houses with steel frame ones . . . . Co-ordinator Eastman always sidesteps the issue on metals for freight cars, referring to "light weight metals." . . . Some of the more militant left-wingers of the administration are whetting their axes for Secretary of Commerce Roper because of his more favorable attitude toward business.

Died:

WILLIAM G. MATHIAS, 63, formerly assistant to the vice president in charge of operations of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., who retired in 1930, in St. Petersburg, Fla., Dec. 18. He was with the North Chicago Rolling Mill Co., part of the Illinois Steel Co. in 1888, transferred to the Birmingham district as assistant general superintendent of the Ensley works, promoted to general superintendent in 1916 and made assistant to the vice president in 1918.

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Joseph B. Smart, engineer, for the Tennessee Coal, Iron & Railroad Co., Docena, Ala., Dec. 14.

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William P. McBride, 47, for many years construction foreman for the Booth & Flinn Co., Pittsburgh, in Pittsburgh, Dec. 16.

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Charles F. Towne, 58, co-founder and secretary-treasurer of the Tonawanda Electrical Steel Co., North Tonawanda, N. Y., at his home in Buffalo, Nov. 28.

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Frank H. Simpson, 67, a director of the American Rolling Mill Co., Middletown, O., at a Concinnati hospital, Dec. 18, after three weeks illness. He was also a director of the National Roll & Foundry Co., Avonmore, Pa.

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Joel H. Fuller, 83, for 23 years vice president and treasurer of the Stowe-Fuller Co., Cleveland, refractories producer, at his home in Nantucket, Mass., Dec. 14. He had retired six years ago. The Stowe-Fuller Co. was organized in 1890, Mr. Fuller serving for a time as president.

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Dana Pierce, 63, widely known electrical safety engineer, in Atlantic City, N. J., Dec. 18. He was a resident of Highland Park, Ill., and at one time was director of the electrical department of the Underwriters' Laboratories, Chicago, in 1923 being made president of the organization.

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Guy Percy Heathcote, 63, treasurer of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., in that city, Dec. 12. He became associated with Giddings & Lewis in 1914 as cost accountant and industrial expert and developed a system that has been adopted generally by machine tool builders.

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William H. Devlin, 73, former superintendent of the North Sharon, Pa., plant of Carnegie Steel Co., in Sharon, Dec. 17, after a long illness. Born in Scotland, he came to this country 43 years ago and in 1903 supervised the reconstruction of La Belle Iron Works plant at Steubenville, O.

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A. Bruce Fahnestock, 57, inventor, consulting engineer and associate of Norman Bel Geddes, noted designer, at a Long Island, N. Y., hospital, Dec. 18. At one time he was consulting engineer for Westinghouse Electric & Mfg. Co., leaving this post to develop a domestic stoker which, at the time of his death, had not ben completed.

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Walter Macleod, 61, British vice consul for southern Ohio and president of the Macleod Co., manufacturer of sandblast equipment and foundry supplies, at his home in Cincinnati, Dec. 18. He had numerous inventions to his credit, including a paint sprayer, oil burner and sandblasting machines for cleaning buildings and bridges.

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William Quincy Wales, 84, president and one of the founders of the Brown-Wales Co., Boston, well known steel warehouse interest in the New England district, in West Newton, Mass., Dec. 14. A native of Boston, Mr. Wales graduated from the Massachusetts Institute of Technology in 1872 and with John G. Brown founded the firm bearing their names.

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Vernon Royle, 88, president and treasurer since 1885 of John Royle & Sons, Paterson, N. J., machinery manufacturers, at his home in that city, Dec. 17. He is said to have held more than 150 patents on improvements he had invented for machines and tools used in photoengraving, textile and fire-hose weaving, rubber shaping and the manufacture of electrical insulation.

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M. S. Ketchum, 62, dean emeritus of the college of engineering, University of Illinois, Urbana, Ill., Dec. 19. He was graduated from the University of Illinois in 1895 and at one time was contracting manager for the American Bridge Co. at Kansas City. Later he became, successively, dean of the University of Colorado, college of engineering, administrative director of the government's powder plant at Nitro, W. Va., and professor of civil engineering at the University of Pennsylvania. From 1927 until his retirement last year, Dean Ketchum was associated with the University of Illinois.

Analysis of Use of Tin

United States consumption of tin in the first seven months of 1934 included 14,050 tons in tin plate, 2130 tons in babbitt, 5630 tons in solder and 6560 tons in bronze, foil and collapsible tubes. World tin consumption in the 12 months ended with July was 124,800 tons, compared with 110,221 tons the preceding year.

Industrial Men in the Day's News

Charles J. Stilwell, New President, National Machine Tool Builders' Association

—Harris & Ewing

Since 1910 he has been associated with a leading machine tool building company, is now vice president.

In this work he has had wide experience in foreign markets, at one time being foreign sales manager.

A member of foreign trade committees in several associations, he is active in industrial marketing.

CHARLES J. STILWELL, vice president and director of the Warner & Swasey Co., Cleveland, and recently elected president of the National Machine Tool Builders' association, was born in Freehold, N. J., Sept. 13, 1886. His family later moved to Ohio. He is a graduate of Denison university, Granville, O.

In 1910 he became associated with Warner & Swasey. After taking the company's special apprentice course he spent two years in the New York office. In 1913 and 1914 he was the company's European representative. From 1914 to 1918 he served as assistant to the president. In the latter year he was made foreign sales manager, and in 1922 general sales manager. In 1929 he was elected a director and in 1930 was named vice president, in which position he has continued to the present time.

His experience in foreign markets should be particularly valuable to the tool builders' association. Besides spending two years in Europe he has served as chairman of the foreign trade committee of the Cleveland chamber of commerce and is a member of the committee on Russian-American trade of the National Association of Manufacturers, and the national advisory committee on foreign service of the National Foreign Trade council.

He is also a member of the Midwestern Marketing society and has served as vice president in charge of industrial marketing of the American Management association.

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M. L. Eckman, formerly engineer for the Federal Machine & Welding Co., Warren, O., and for many years associated prominently with the welding industry, has been appointed head of the research and development department of the Thomson-Gibb Electric Welding Co., Lynn, Mass. At one time he was associated with the Ford Motor Co., and in addition to his work in this country has spent considerable time in Europe with both manufacturers and users of welding equipment.

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S. R. Schachtel has been appointed district manager at Youngstown, O., of the David Joseph Co., iron and steel scrap. Mr. Schachtel has been assistant for several years to Philip W. Frieder who, as vice president, has been in charge of the Joseph company's affairs in Youngstown, but who will enter the scrap business Jan. 1 under the name of Phil W. Frieder Co.

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J. J. Murray has been appointed New York district representative for the Swedish Crucible Steel Co., Detroit, manufacturer of carbon, manganese, and chromium-nickel alloy castings. His offices are at 225 West Thirty-fourth street, New York.

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F. A. Hansen, since 1927 general manager of the Hevi Duty Electric Co., Milwaukee, and prior to that time active with Westinghouse Electric & Mfg. Co., General Electric Co. and the Bell Telephone System, is now associated with the Lindberg Steel Treating Co., Chicago, in charge of engineering and production of new control instruments. He served for several years as chairman of the Milwaukee chapter of the American Society for Metals.

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E. R. Jefferson, 332 South Warren street, Syracuse, N. Y., has been appointed sales agent for refractories produced by Babcock & Wilcox Co., New York, in the central and central western sections of New York state. He also represents other manufacturers of industrial and power plant equipment.

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Leon Ehrman has resigned as blast furnace superintendent of Woodward Iron Co., Woodward, Ala. He was formerly superintendent of the Sloss-Sheffield city furnaces, Birmingham, Ala., leaving for Woodward in October, 1933.

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Paul Ivy, vice president of the National Cast Iron Pipe Co., Birmingham, Ala., recently was elected a vice president of the Birmingham chamber of commerce, to be in charge of industrial activities.

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Paul W. Gregory has been appointed general manager of the Canton Culvert Co., Canton, O., subsidiary of Republic Steel Corp. He succeeds F. A. Kelly, who recently was appointed president of the Toncan Cul-

Paul W. Gregory

vert Manufacturers association, Youngstown, O., and head of Republic's culvert division. For the past 15 years Mr. Gregory has been associated with the Wheeling Corrugating Co., division of Wheeling Steel Corp., Wheeling, W. Va.

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Robert T. Paine II, for 40 years a director of the General Electric Co., Schenectady, N. Y., has resigned from the board because of ill health.

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E. B. Meyer, vice president, United Engineers & Constructors Inc., Newark, N. J., has been nominated for president of the American Institute of Electrican Engineers, for the year beginning Aug. 1, 1935.

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Fred C. Gardner, treasurer of the E. C. Atkins & Co., Indianapolis, saw and knife manufacturer, has been named by the Indiana Manufacturers' association to a committee of citizens and legislators which will study operation of the Indiana gross income tax law and suggest possible changes.

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C. E. Wilson, vice president of the Worthington Pump & Machinery Corp., Harrison, N. J., has been placed in charge of recently-established Pacific Coast regional headquarters of the corporation at 510 West Sixth street, Los Angeles. He has traveled abroad extensively for Worthington and from 1923 to 1932 was general sales manager.

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Howard Coonley, president, Walworth Co., Boston, has been re-elected vice president of the American Standards association for 1935. Frederick E. Moskovics, representing the Society of Automotive Engineers, has been re-elected vice president.

J. C. Irwin, Boston & Albany railroad, and F. M. Farmer, Electrical Testing Laboratories, New York, were re-elected chairman and vice chairman, respectively, of the standards council of the association.

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Frank J. Stanley, formerly general superintendent, Locomotive Finished Material Co., Atchison, Kans., has been made general superintendent of the Crucible Steel Casting Co., Cleveland. He served his apprenticeship with the Commonwealth Steel Casting Co., Granite City, Ill., and has been identified prominently with the steel foundry field. For eight years he was associated with the Michigan Steel Casting Co., Detroit, where he ultimately became general manager.

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Klaus L. Hansen, consulting engineer, Harnischfeger Corp., Milwaukee, has been elected temporary chairman of a recently organized Milwaukee section of the American Welding society. Temporary organization of this group was effected Dec. 14 when Milwaukee welding engineers met with members of the Chicago section of the society at the School of Engineering in Milwaukee.

John J. Chyle, welding research engineer, A. O. Smith Corp., was elected temporary secretary. A second meeting is planned about the middle of January to perfect the organization and arrange a regular meeting schedule.

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Dr. Willis R. Whitney, who has directed the research laboratory of the General Electric Co. at Schenectady, N. Y., since 1900, building it into one of the finest research laboratories in existence, has been named recipient of the Edison medal for 1934 of the American Institute of Electrical Engineers. It will be presented at the institute's winter convention in New York, Jan. 22-25. Dr. Whitney now is vice president in general charge of research for General Electric.

□ □ □

Robert F. McCloskey has been appointed vice president in charge of operations for Blaw-Knox Co., Blawnox, Pa. He was previously general superintendent of the company's Blawnox shops and has been associated with the company since 1920, first starting as manager of the division then located at Sharon, Pa. In 1922 he was made production manager of the Blawnox, Pa., shops and in 1931 became general superintendent. He succeeds the late Wayne Rawley.

□ □ □

Henry F. Pope, for the past 21 years president of the National Malleable & Steel Castings Co., Cleveland, and associated with the company since July 1, 1884, has been named chairman.

Carl C. Gibbs, for the last five years assistant to the president, has been appointed president. He started with the company at its Indianapolis plant in 1905.

□ □ □

Ambrose Swasey, chairman of the Warner & Swasey Co., Cleveland, machine tool and astronomical instrument builder, celebrated his eighty-eighth birthday Dec. 19 at his office, revealing to colleagues that Dr. Otto Struve of the Yerkes observatory had given a newly-discovered planet between Jupiter and Mars the name "Swaseya." Surveying the industrial situation, he said in part: "There are literally billions of dollars of potential business in the United States, a fraction of which will put the durable goods industries back on their feet. Business men must show faith in their country and courage in the future. This old ship of state has sailed through many a storm and has always come out all right."

Veteran

CHARLES S. LOCKWOOD has completed 60 years of continuous service with the Hyatt Roller Bearing Co., Newark, N. J., and on Dec. 18 was given a testimonal dinner at the Newark Athletic club by the executive staff and department heads. Only 83, he is still an active member of the Hyatt experimental staff, nearly 100 patents having been issued in his name since 1874, when he first became associated with the laboratories of John Wesley Hyatt. Mr. Lockwood and Mr. Hyatt collaborated on many inventions, among them celluloid, roller bearings, grinding machinery, filtration systems and others, the Hyatt company being formed in 1892 as an outgrowth of their work with the roller bearing

Here and There In Industry

ELECTRIC CONTROLLER & MFG. CO., 2700 East Seventy-ninth street, Cleveland, has been awarded the contract for controllers, brakes and limit switches for the auxiliary drives on the new 44-inch blooming mill and 56-inch continuous hot strip mill now under construction for the Ford Motor Co., Detroit.

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Brelie Mfg. Co., 136 South First street, Milwaukee, manufacturer of small gears and other precision parts for office machines, clocks and similar mechanisms, feels improvement in demand for its products on a wide scale. Henry C. Brelie is president and general manager.

□ □ □

Champion Spring Co., 6115 Park avenue, Cleveland, celebrated its fiftieth year Dec. 21 by a banquet at which employes were awarded bonus checks according to their length of service. The company was founded in 1884 as the Champion Spring Bed Co. and was incorporated in 1888. C. F. Lemke has been president and Miss A. W. Linde secretary-treasurer since 1920.

EDITORIAL

A.F.L. Stand on Wage Policy Is Harmful to Employes

THE frequency with which William Green and other representatives of the American Federation of Labor reiterate their demands for blanket short week legislation and a basic minimum annual wage makes one wonder whether the labor chiefs are working primarily for the welfare of the employes they claim to represent or whether they are interested to an even greater extent in stirring up trouble and in amassing greater power for themselves.

A. F. L. leaders cleverly capitalized the hearing on employment conditions in the automobile industry, conducted by Leon Henderson of NRA, by introducing a program which they claim would go far in stabilizing the automobile industry from the union man's standpoint. A. F. L. representatives interjected a platform embracing planks so contradictory that, again, one is prompted to question the sincerity of its sponsors.

The planks include a basic 30-hour week, with provisions for increasing it to 36 hours for a 10-week peak period or reducing it to 24 hours in slack seasons; prohibition of layoffs until plants are on a 24-hour week; provision that layoffs after a 24-hour week has been scheduled shall be on a seniority basis; and a basic minimum wage of $1500 annually.

Belatedly, Professional Union Leaders Shift Emphasis from Unit Wages to Annual Income

This proposal is worthy of comment because it is typical of what professional labor will demand of many industries and because it reflects the significant new emphasis which A. F. L. in recent weeks has been placing upon annual income as against its previous emphasis on hourly wages.

Mr. Green and his associates are wise in shifting this emphasis; they should have done it 10 or more years ago. By fighting strenuously for high hourly rates, particularly in the building trades, they won high unit wages for their members, but at the same time they sharply curtailed the volume of work available. This mistake, coupled with the prevalance of jurisdictional difficulties, has given professional union labor a notoriously bad record in the building field.

Assuming that A. F. L. recognizes this as a mistake and that henceforth it intends to shape its demands to accord with the requirements of a minimum annual income, we come to several important questions. First, in demanding a basic minimum wage of $1500 annually, does A. F. L. imply that employers are obligated to guarantee that amount, regardless of business conditions? Secondly, can a blanket 30-hour week, as advocated by A. F. L., be reconciled with a basic minimum annual wage?

The answer to both questions, as is well known by Mr. Green and his associates, is "No." They know, as does any intelligent individual, that guaranty of a specified annual income is incompatible with economic laws, regardless of whether they operate in the environment of a capitalistic, communistic or Fascist state. Similarly they know that the hours of labor per week are determined by the efficiency of the entire economic mechanism for production, that the progress of this period works toward a steady reduction of hours, and that legislation which fixes hours at an arbitrary figure is likely to retard that progress rather than to stimulate it.

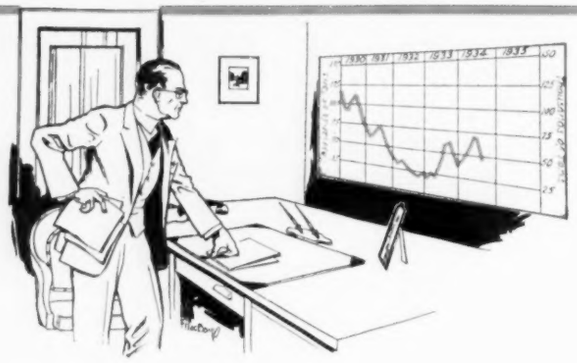
Cannot Reconcile Short Week and Resulting High Wage with Annual Income Guaranty

As for reconciling a maximum hourly week with a minimum annual income, the prospect is dubious, as Mr. Green and his cohorts well know. The short week always means an increased hourly rate, and under present conditions inevitably restricts volume of business, and therefore tends to reduce the annual income. If the experience of NRA proved anything, it proved that maximum hours and artificially pegged wage rates tend to dry up demand and, except for an initial, short lived influence to spread work, in the end defeat the purpose of their enactment. To inaugurate the 30-hour week after the 40-hour week has failed to stimulate employment effectively is but to compound the consequences of a proved mistake. To erect the meritorious philosophy of an adequate annual income upon the uncertain foundation of maximum hours and pegged hourly rates is folly.

The very best thing that can be done for the average American employe is to adopt a wage scale which is responsive to the consuming market. It would cut his hourly wage sharply, but increase his annual wage considerably.

A. F. L. leaders know this. Why do they not advocate it? Probably because they really represent only one out of seven gainfully employed persons and because they are much more interested in hoodwinking the nation into giving their little minority more power than they are in helping the employe to improve his position.

THE BUSINESS TREND



Business Is Staging Garrison Finish in Twelfth Month

MANY lines of industrial activity are putting on a strong finish in the 1934 business derby. Steelworks operations now are more than half way between 30 and 40 per cent, the automobile industry is stepping up production rapidly and orders in many branches of the equipment industry are heavier.

Indicative of this last named improvement is the rise of the index of gross orders for foundry equipment from 55.3 in October to 80.4 in November. This is the highest point recorded since March, 1931. The three-months' moving index for machine tool orders increased from 40.5 in October to 44.2 in November. The volume of machine tool business for 1934 will exceed that of 1931.

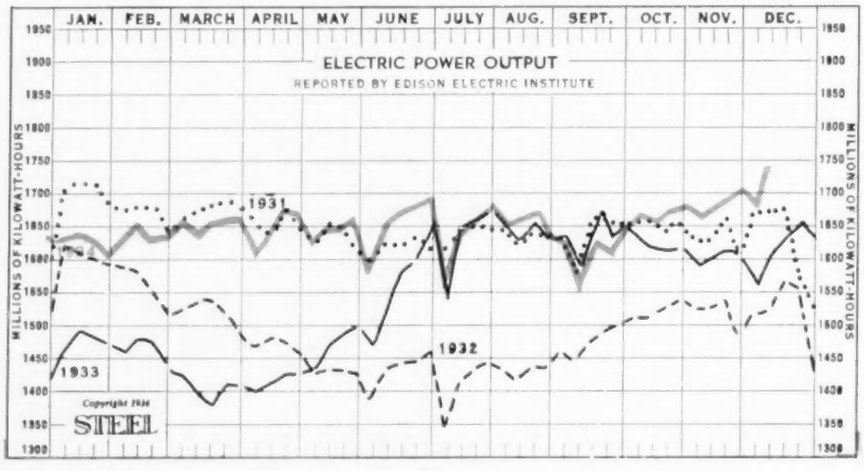
The weekly statistics, which give a fairly prompt picture of current trends, again are tending upward uniformly. Revenue freight car loadings recovered remarkably well from the surprisingly low figure registered in the week ending Dec. 1, which included Thanksgiving day. From a point lower than in the corresponding week of 1933 or 1932, loadings rebounded to a level higher than in either year. Freight traffic for the week ending Dec. 15 will increase the spread of current loadings over those of the previous two years. This gain is contrary to trend in the corresponding period of each of the last four years.

Weekly Power Output in Higher Brackets; More Favorable Dividend Action Reported

After rising sharply in the week ending Dec. 8, electric power output in the week ended Dec. 15 leaped to 1,767,418,000 kilowatt hours. One has to thumb through the records to 1930 to find a higher figure. Further increases aggregating 93,000,000 kilowatt hours would carry the output to the highest point of 1929.

That industry's profits in 1934 have had a noticeable influence on dividends is indicated by a compilation by the Standard Statistics Co. which shows that favorable dividend actions in 1934 up to Dec. 12 totaled 1308 compared with 807 in the corresponding period last year. In 1932, the lowest year for profits, the corresponding total was 559.

1934 Million Kw.-Hr.	
Dec. 15	1,767
Dec. 8	1,743
Dec. 1	1,683
Nov. 24	1,705
Nov. 17	1,691
Nov. 10	1,675



1933 Million Kw.-Hr.	
Dec. 16	1,644
Dec. 9	1,619
Dec. 2	1,553
Nov. 25	1,607
Nov. 18	1,617
Nov. 11	1,616

1934 Machine Tool Volume Will Surpass 1931 Total

Increasing demand for machine tools pushed up the three months' moving index of orders from 40.5 in October to 44.2 in November. The gain is accounted for by a 12 per cent gain in the volume of domestic orders and a slight increase in foreign orders. According to the report of the supervisory agency, machine tool business in 1934 will exceed that of 1931. The 11 month average index for 1934 is 44.3, against an average of 41 for all of 1931.

November, 1934	44.2
October, 1934	40.5
November, 1933	45.9

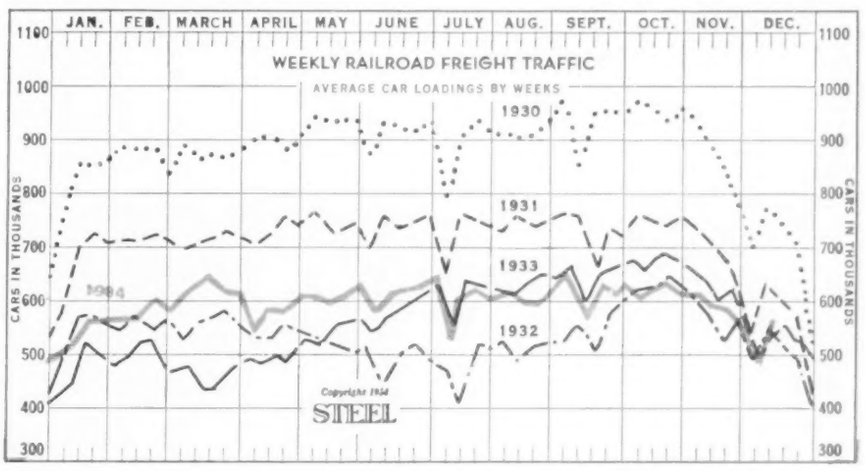
October, 1934	$48,624,984
September, 1934	41,020,484
October, 1933	57,366,045

Class I Net Operating Income Is Higher in October

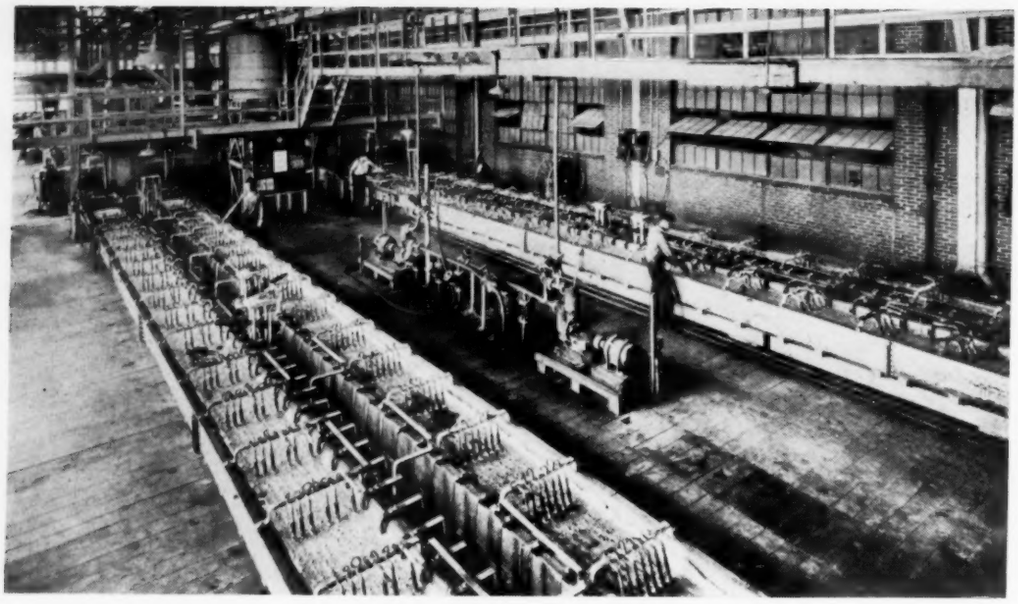
Net railway operating income for Class I railroads in October totaled $48,624,984, according to the report of the bureau of railway economics. This compares with $41,020,-484 in September and $57,366,-045 in October, 1933, and represents a return of 1.46 per cent on property investment. For 10 months of 1934 the return was 1.75 per cent as against 1.77 per cent in the same period of 1933, notwithstanding the fact that the operating ratio increased from 72.15 to 74.32 per cent.

Freight Traffic Rebounds; Exceeds 1932, 1933 Levels

While revenue freight car loadings in the week ending Dec. 1 dropped to the lowest figure registered for Thanksgiving week in any recent year, the rebound in the week ending Dec. 8 carried them to a point higher than the corresponding figures of 1933 and 1932. Preliminary figures for the week ending Dec. 15 indicate another sharp increase. This is counter to the usual trend for this week of December. Declines are the rule for the final three weeks of the year.



	1934	1933
December 8	551,011	541,992
December 1	488,118	499,596
November 24	561,313	585,738



BATTERY of electrolytic cells, each accommodating eight wires. Cells are 55 feet long, lead lined, with zinc strip anodes dividing the cells into compartments

Illustrations courtesy Bethlehem Steel Co.

IMPROVED COATING APPLIED TO

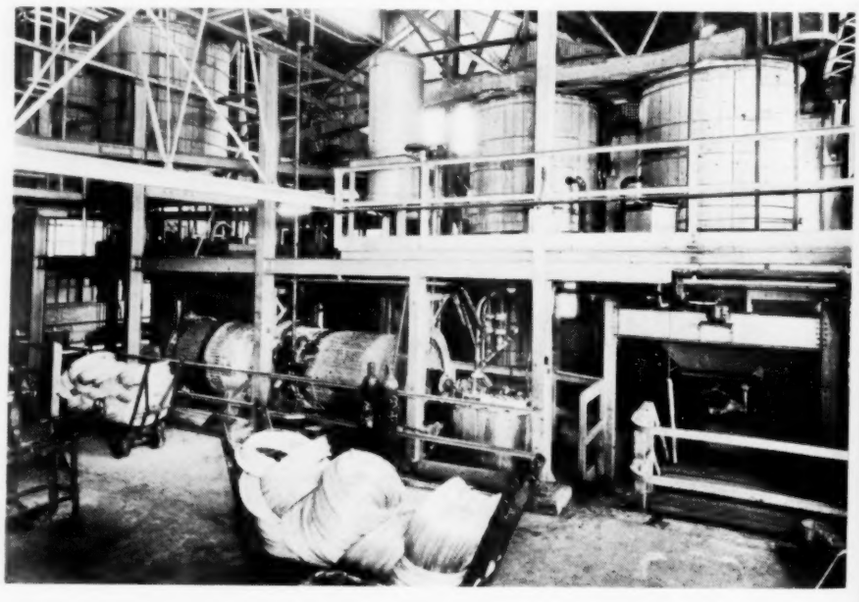
DURING many years of research, scientists have been striving to improve protective coatings on steel wire in order that heavier coatings of greater ductility could be made available that would not crack or peel when the wire was bent around its own diameter or given other severe bending in use or in fabrication into wire products. By an electrogalvanizing process for zinc coating wire, now in use at the Maryland plant of the Bethlehem Steel Co., Sparrows Point, Md., zinc can be applied to steel wire with two or three times heavier thickness than by any previously known process. The coating thus produced is zinc of high purity, claimed to be so ductile and so tightly adherent to the steel base that it will not crack, flake or chip off under severe distortion.

The treatment has been termed Bethanizing, and the wire is now being used extensively in the manufacture of fence for farm, industrial, or ornamental use; telephone and telegraph wire, bond wire, strand, wire brushes, wheel spokes, wire springs, and many other applications requiring severe bending or twisting in fabrication and long life against corrosion.

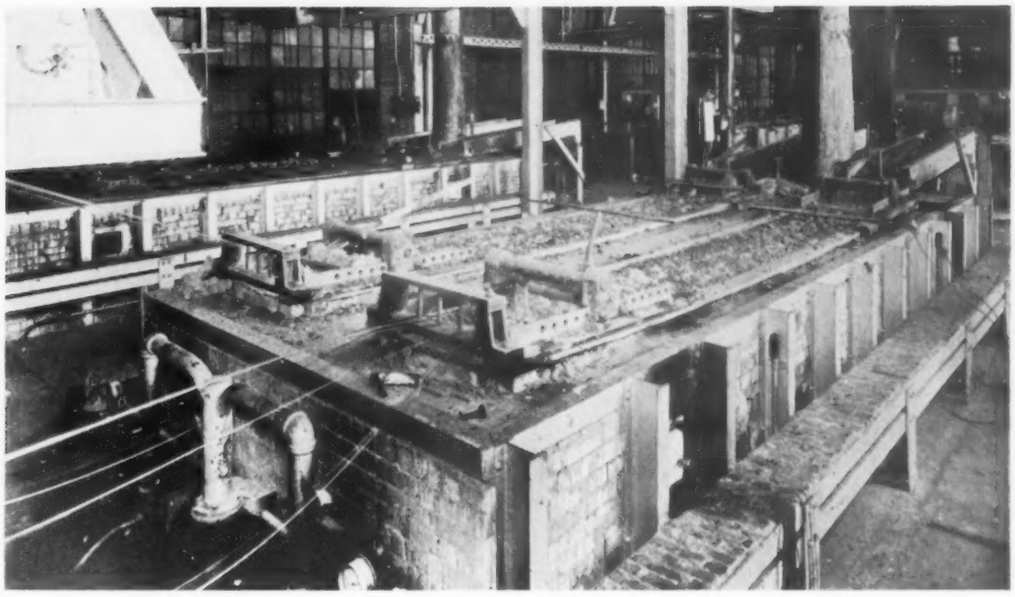
The process which distinguishes this zinc coated wire from all other galvanized products is electrolytic, the pure metal being deposited from a liquid solution to the steel.

The refinement of the zinc to be used for electrogalvanizing is given much more attention in the process than in the hot galvanizing process, the method commonly employed in zinc coating wire. Zinc is received in the form of roasted ore—a reddish-brown powder analyzing about 65 per cent zinc. From storage bins it is weighed accurately and put into leaching tanks containing a specified concentration of sulphuric acid.

This mixture is piped to a Burt filter, from which the filtrate is pumped into a purification tank, where incidental impurities are all



IN THE background are storage tanks, filters and purification vats where pure zinc sulphate is prepared chemically direct from roasted ore for supplying the electrolytic cells. Bundles of finished wire are shown in the foreground



FIRST treatment given the wire in the electrogalvanizing process is annealing, carried out in these lead bath annealing furnaces. Wire passes through the bath continuously

WIRE BY ELECTROGALVANIZING

removed. This purified zinc sulphate is again filtered and pumped into a check tank from which samples are analyzed to establish its purity. If any impurities are found, the filtering and purification is repeated. When absolute purity of the solution is established, the liquid is pumped into the final storage reservoir which continually feeds into the electrolytic cells.

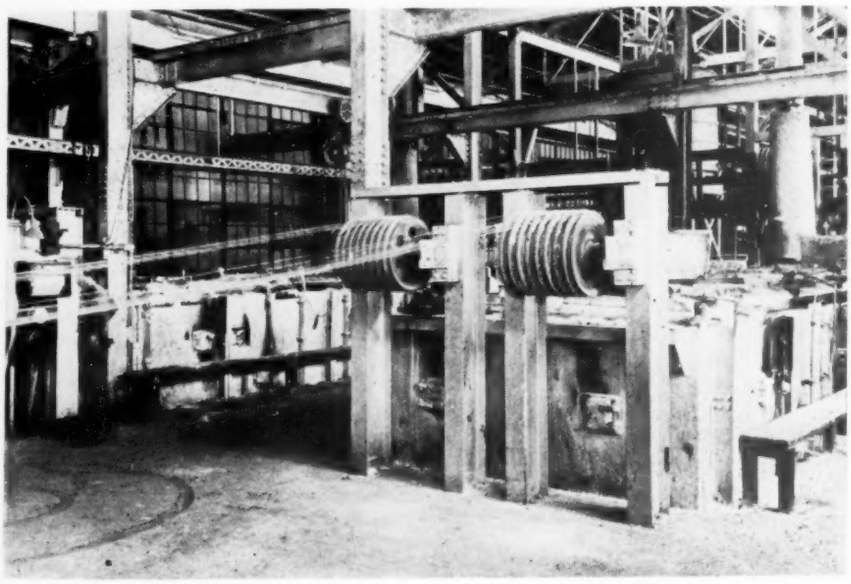
Bright steel wire, after passing through a lead annealing bath, receives a different cleaning action than commonly employed in the hot galvanizing process. This cleaning is accomplished by the use of electrolytic cleaning through fused caustic soda supplemented by a further electrolytic acid cell. This double electrolytic cleaning removes the last traces of oxide and other impurities.

The zinc coating is applied in electrolytic cells 55 feet in length and wide enough to accommodate a number of wires in parallel. The cells are lead lined and are provided with anodes in the form of strips. These anodes extend the entire length of the cell and divide it into compartments through each of which a single wire is drawn. Current is thus uniformly introduced into the plating solution which surrounds each wire.

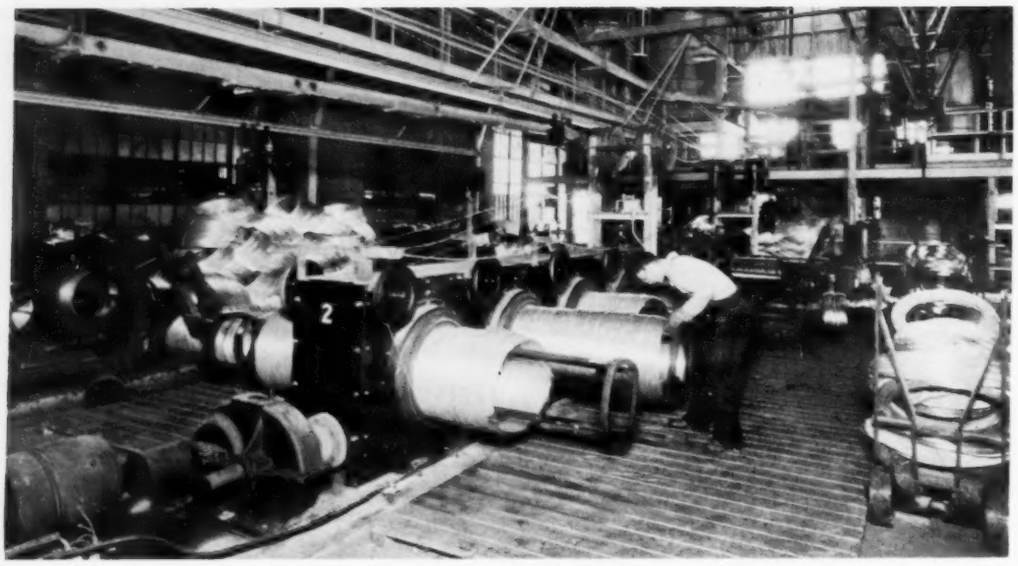
Supported on Glass Rods

In the cells, current flows through the solution to the wire and is taken off the wire by means of contacts spaced at regular intervals. These contacts rest on the wires as they travel through the cell. The wires are prevented from sagging under the weight of the contacts by means of glass rod supports which extend across the cell under the wires.

The four cells now in operation are supplied with direct current from a 250-kilowatt motor-generator set at 20 volts. High current density is employed, ranging from 700 to 1400 amperes per square foot. The current density ordinarily used in other electrolytic operation is lower, usual-



AFTER annealing and before electrogalvanizing the wire is given a double electrolytic cleaning through fused caustic soda, the unit shown here, and a further electrolytic acid cell. All traces of oxide and other impurities are removed



FOLLOWING application of the electrodeposited zinc coating the finished wire is wound on these reels for shipment. An inspector watches the wire as it is being reeled

ly ranging from 70 to 150 amperes per square foot.

This successful application of high current density is one of the important factors in the development of the electrogalvanizing process. While there is no limit to the thickness of zinc that can be obtained, Bethlehem, at present, has standardized upon three grades with coating as to minimum; thicknesses 0.8, 1.6, and 2.4 ounces of zinc per square foot, respectively, for base sizes. Wire ranging from 6 to 16 gage is now being manufactured regularly.

Because of the control that is possible in the thickness of coating applied, and its uniformity, the treated wire can be made to render almost any length of service desired. This, together with the purity of the zinc and its tightness and ductility, will extend the customary applications of zinc coated wire, and also open up new fields for its use. It is generally considered that wire with extra heavy coatings may be substituted economically in place of some of the more expensive metals and alloys.

Etching Method Reveals Carbides in 30 Seconds

Welding of stainless steel of the 18-8 chromium nickel type often results in a structural change, usually considered to be detrimental, wherein carbides are formed within and around the constituent grains, according to the national bureau of standards, Washington.

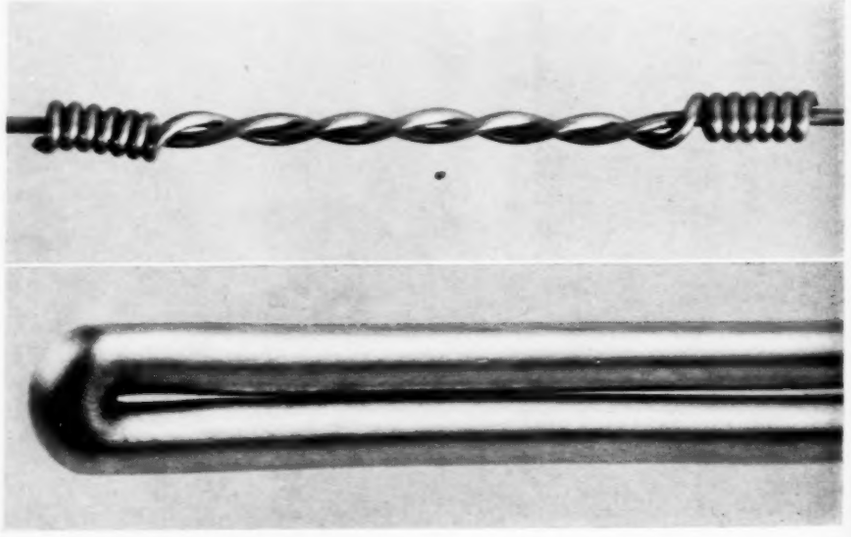
The use of certain metallographic etching methods for revealing this condition is frequently included in specifications, electrolytic etching in a solution of sodium cyanide being a common method. This method, although superior to most others, has a number of drawbacks, it is stated.

A new method recently used by the bureau in an extensive study of the changes induced upon welding, in special alloy steels, promises to be far superior to all others, according to H. S. Rawdon, chief of the bureau's metallurgy division.

The method consists of etching electrolytically in oxalic acid, 10 grams in 100 milliliters of water, the specimen being the anode and a piece of platinum the cathode. The current from three standard dry cells in series or from a 6-volt storage battery serves to reveal carbides in the metallographic structure in 15 to 30 seconds and the grain structure on etching about 30 seconds longer. The solution does not stain the specimen—a drawback of almost all other methods.

New Book on Filtrations In Chemical Laboratories

"Filtrations in Chemical Laboratories" is the title of a 136-page handbook on filtering operations for the chemist issued by Carl Schleicher & Schull Co., 167 East Thirty-third street, New York. It contains chapters devoted to work in metallurgical plants, chemical works, breweries and distilleries and other industries and is accompanied by an appendix on large scale production filtrations in manufacturing plants. This book is a second and revised and enlarged edition of the previous volume issued by this company.



UPPER illustration shows a splice made in electrogalvanized telephone wire. Note absence of surface cracks. Lower view shows the wire bent back flat on itself without cracking the surface coating

Welded Design Calls for Special Attention to Materials and Technique Involved

BY EVERETT CHAPMAN
Lukenweld Inc.

POSSIBILITY that the average stress equals the maximum stress in an ideal material leads to some interesting conjectures on the possible strength of materials, according to Everett Chapman, vice president, Lukenweld Inc., Coatesville, Pa., in a paper entitled "Steel and Cast Iron in Stress-Transmitting Mechanisms" presented at the annual meeting of the American Society of Mechanical Engineers in New York on Dec. 4. After contrasting steel with ordinary gray cast iron as regards tensile, impact and related values, Mr. Chapman envisages future possibilities for improving the characteristics of steel. His remarks on this subject are abstracted in the accompanying article

STEEL is by no means the pure, homogeneous material that it is usually visualized. What strength would steel exhibit if it were rid of the minute impurities, minute internal checks and internal strains known to exist in the commercial product?

The cohesive forces between the atoms making up a material determine its theoretical strength. This atomic bond can be calculated from a laboratory measurement of the latent heat of vaporization of a given material and, assuming that the same degree of cohesion exists at room temperatures as exists at the vaporizing point, will give a value

Fig. 1—Etched cross-section of poorly made weld, severely undercut at one edge

for the atomic bond of at least the right order of magnitude.

Griffith, in England, measured these values for common glass. It was chosen in his experiments because the phenomena of plastic action was not present to confuse the behavior of the tensile specimens. The measured strength of the glass chosen was 25,000 pounds per square inch. This is the average statistical strength of the gross mass with all its internal discontinuities and internal strains as present in a tensile test bar. The atomic forces, as measured by the latent heat of vaporization, demanded that the material show a strength of around 500,000 pounds per square inch. Griffith then broke fine threads of this material, measuring the stress at rupture. Fragments of the same thread were then broken and measured, and the fragments resulting from this test were again broken and measured.

He was selecting his final test specimen as that fragment which outpulled all the cross sections that had failed during the test. His final test specimen, thus selected on the basis of tensile elimination of internal flaws and defects that tended to raise the average stress, broke at a stress of 491,000 pounds per square inch.

Shows Effect on Materials

This is a remarkably interesting indication of the possible strength of materials in the homogeneous state. It is a poignant illustration of what a wide spread between maximum and minimum stress will do to either an engineering material or an engineering structure.

The ratios involved in Griffith's experiments are also a measure of the progress that is still to be made in the manufacture and use of structural steel. It is due to the points of maximum stress that the inherent abilities of steel are not more fully realized, that materials

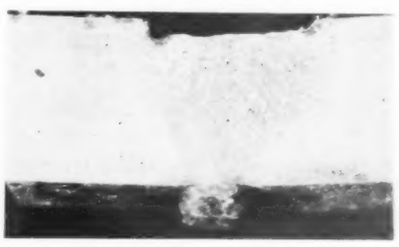


Fig. 2—Poorly made weld which is undercut on the side from which metal was deposited

cannot be worked at higher loads and that factors of safety must be what they are.

The atomic bond in pure iron, as theoretically deduced from its latent heat of vaporization, indicates that the strength of steel should be about ten times the observed values in ordinary commercial steel. The difference between the observed values

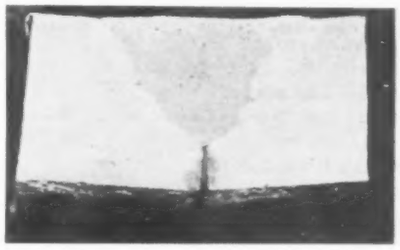


Fig. 3—Weld which has not penetrated completely to the far side

and the theoretical values can be reasonably supposed to be due to stress-raising, nonmetallic impurities, minute internal cracks resulting from cooling, and internal strains distributed at random that pre-load the material from point to point.

Is it not reasonable to conceive that the known strengths of materials and structures are the difference between the theoretical strengths of the atomic bonds and the damage done by such minute phenomena as notches, nonmetallic impurities, distributed graphite, screw threads, unfused roots of welds, sharp fillets and all such forms of discontinuities?

Modern weld metal is a freak. Its properties seem to give a clue to what might be expected from theoretically clean materials. It is possible to produce in the electric arc, in the form of weld metal, a steel with carbon content of 0.08 per cent, tensile strength of 65,000 pounds per square inch, and an elongation of 35 per cent in 2 inches. These properties, furthermore, are shown in the cast condition and material of the same analysis made in the open hearth by modern steelmaking practices will not begin to show, in any respect, the physical properties of the weld metal.

The essential difference seems to

Fig. 4—Weld made from both sides, with incomplete fusion at the root of the weld

be first, the treatment of minute drops of metal, second, the use of well-designed slag, third, exclusion of the atmosphere, and fourth, temperatures much higher than can be obtained in the open hearth. The resulting metal is much cleaner than commercial open-hearth steel and it is not a coincidence that its physical properties are superior to open-hearth steel which is of equivalent chemistry.

The commercial existence of such a metal, together with the fact that it can be used to integrate rolled steel, has several important implications for the designer of structures and the makers of steel. The freedom of welded design inherently implies the ideal structure, with its smooth-flowing contours and its homogeneous, elastic properties. That such material as modern weld metal can be produced is an incentive to both the maker of steel and the designer of structures to reduce, perhaps eliminate, the number of damaging discontinuities in their steels and their structures. Without investigating the feelings, mathematical treatments and experimental methods that distinguish the master designer, it may be pertinent to illustrate some of the abuses of welded joints that tremendously detract from the efficiency of a welded structure.

Examples of Poor Welds

Fig. 1 pictures an etched cross-section of a poorly made weld. It has been severely undercut at one edge. Fig. 2 illustrates an example of welding that, if used under load, will entirely discredit the use of weld metal where-ever such practice is found. The weld is undercut on the side from which the metal was deposited. The drippings of hot metal on the far side are not only badly oxidized, because they lacked the protection of the electrode, but also form a discontinuous projection which will introduce a high root stress. The designer's factor of safety covering this joint will have to be great enough to reduce to a safe value either the stress at the root of the undercut or the stress at the root of the oxidized projection, taking into account the damaged metallurgical condition of the drips.

Working Strength Lowered

Fig. 3 is an example of a weld that has not completely penetrated to the far side. The incipient rip, introduced by the unfused root, reduces the working strength of such a joint by at least six times.

Fig. 4 shows a welded joint made from both sides in which the workmanship was such that neither the weld metal nor the steel has an opportunity to perform as a homogeneous, elastic entity. The fusion at the root of the weld is incomplete, introducing a void at right angles to the applied load that is as bad or worse than any maximum stress condition that could be introduced by graphitic flakes.

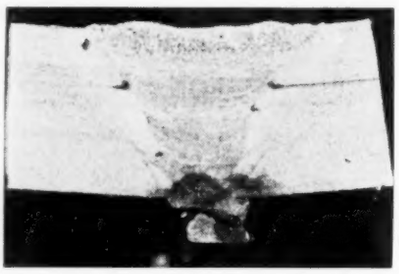


Fig. 6—Weld made from one side only on steel containing layer of gas-forming impurities

Fig. 5 is another example in which not only did the incomplete fusion result in failure but the perfection of the weld metal has been entirely nullified by the porosity present. The porosity was due to the fact that the electrodes were not used at their proper current density.

Fig. 6 illustrates a welded joint in which a combination of troubles are present. The weld has been attempted entirely from one side which results in the usual oxidized projection of metal on the far side. In addition, the steel itself was not properly adapted for ideal welding. It exhibits a layer of gas-forming impurities which, under the heat of the arc, produce great volumes of gas, generally in such large quantities that the electrode, with its normal boiling action, could not eliminate them. This joint again illustrates the abuse of material with excellent physical properties in conjunction with a parent metal that is not the equal of the material used for joining.

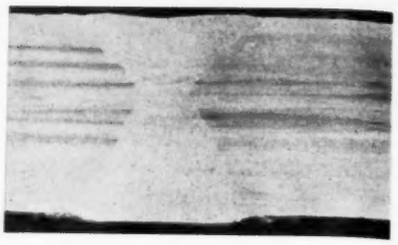


Fig. 7—Sound weld made on parent steel of poor welding properties

It is possible to make a good weld on poor parent metal if the proper technique is observed. Fig. 7 shows a sound, homogeneous weld made on a parent steel of poor welding properties. The parent metal exhibits several banded zones or laminations containing nonmetallic impurities which, under the heat of the arc, will give rise to volumes of gas, some of which certainly will be entrapped.

Features of Good Weld

Fig. 8 demonstrates what can be expected today in a welded joint when the proper steel specifications and welding technique are observed. The joint as a whole presents little change in either external or internal contour. The stress condition over such a joint would be extremely uniform; there are no points of maximum stress of any magnitude. The metallurgical discontinuities that exist in such a joint, due to the thermal abuse of the arc, form different subject matter but they can, however, be corrected to produce a condition of complete homogeneity in the weld.

With the welding technique and the parent metal specification definitely known for the production of the type of joint illustrated in Fig. 8 it remains for the designer to evolve the ideal structure to meet the mechanical demands imposed by his problem.

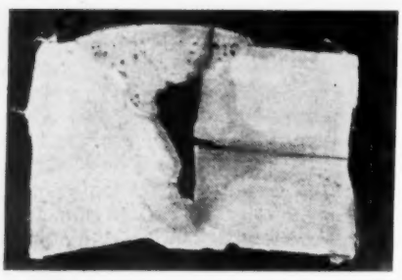


Fig. 5—Weld showing porosity due to electrodes being used at incorrect current density

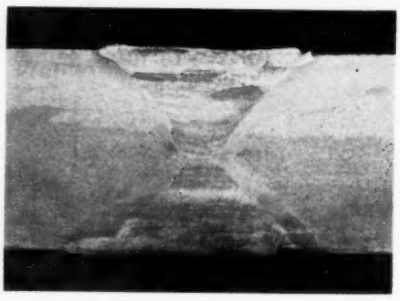


Fig. 8—Welded joint in which proper steel specifications and welding technique have been observed

Classifies Dies for Deep Drawing

DIES for deep drawing fall into five general classes, according to the material from which they are made. These are as follows: (1) Cast iron; (2) plain carbon, water-hardening steels; (3) nondeforming manganese oil-hardening steels; (4) air or oil hardening 2.00 per cent carbon, 12.00 per cent chromium steels; and (5) 0.75 per cent carbon, or chrome-molybdenum cast steels.

This classification was made by Joseph Winlock, chief metallurgist, Edward G. Budd Mfg. Co., Philadelphia, in a paper on deep drawing of sheet and strip steel presented before a recent joint meeting of the Cleveland and Canton-Massillon chapters of the American Society for Metals in Canton, O.

Mr. Winlock stated that cast iron of both the nickel-chromium iron and the straight gray iron are used for the main part of most forming dies. Good resistance to wear is obtained and the small graphite particles always present materially aid as a lubricant and prevent scratches and scoring of the finished stampings. Where greater resistance to wear is necessary, as for example at sharp corners, inserts of steel are used. He said that the Budd company also had recently effectively welded wear-resisting steels to cast iron.

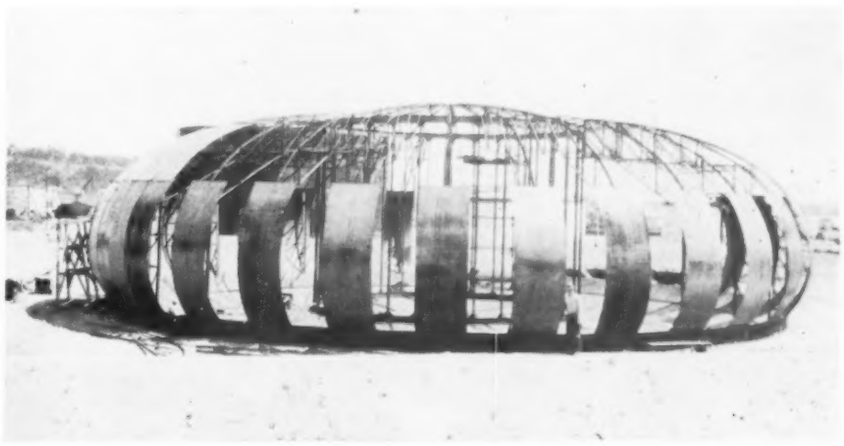
Blanking dies, that is, dies for cutting the necessary shapes in the steel before the deep drawing operations, are made of hardened steel, of course. The choice of one of the types mentioned was said by Mr. Winlock to lie almost wholly in the nature of the job and the anticipated amount of production. The plain carbon steels do not harden deeply, with the result that they possess a tough core. This sometimes is of great advantage; again it may be found necessary to forego this advantage for longer life with less frequent grinding. In these cases, the deep hardening alloy steels are indicated.

S S S

Porcelain Enameling Plant Has Modern Features

A southern metal products company recently installed a new porcelain enameling plant which incorporates efficient layout and equipment. The flow of ware is more or less in straight-line production, thus minimizing back tracking and cross tracking. Provided with an exceedingly high ceiling, good ventilation and plenty of daylight, the pickling department has been made a comfortable place to work. The ground coat dip tank is water cooled, and has proved very satisfactory, for the climate is warm. Sprayed ware is conveyed to the dryer on rubber tired trucks which carry horizontal racks placed one on the other and held in place by dowels. Because of the number of custom built jobs passing through this department, as well as a large number of standard pieces, this type of rack and truck minimizes defective work. The drying department is equipped with a fireproof, gas-fired room dryer, 40 feet

Man-Made Mushroom



HORTONSPHEROID FOR STORING GASOLINE: The familiar spherical shape of the hortonsphere has been flattened out into this form, known as the hortonspheroid, several of which are being installed at various localities. Design and fabrication is by the Chicago Bridge & Iron Works, Chicago. Built up of electrically welded plates, the structure requires 275 tons of steel, has a capacity of 80,000 barrels, a diameter of 136 feet and height of 40 feet 6 inches. Light structural members are erected first to serve as a pattern and to hold plates in position for welding. The tank is designed to withstand a liquid load plus an internal pressure of 1½ pounds per square inch, with the maximum stress in the plates 13,750 pounds per square inch. The structure shown is erected at South Portland, Me.

long and 8 feet wide, made of steel sheets and structural angles, with a unique system of doors along its entire length to accommodate the large pieces which must be placed in the dryer. Large hopper-type tables, made of steel and covered with hard wood grating, are provided in the brushing department.

\$ \$ \$

Monel Pickling Conveyor Withstands Severe Service

A midwestern manufacturer of pressed steel tanks pickles the shells in a 110-foot tank of hot sulphuric acid equipped with a continuous conveyor. The largest shells, 29 inches in diameter and 70 inches long, travel through the tank at the rate of 100 an hour; the smallest, 6 inches in diameter and 16 inches long, go through at the rate of 400 an hour. All metal parts of the reciprocating mechanism of the conveyor are submerged in the acid bath and are made from rolled monel metal rods, flats, angles and channels. Although this conveyor has been in continuous operation for 3 years, the monel metal parts are in perfect condition.

\$ \$ \$

Dairy Equipment Makers Using Aluminum Paint

A noticeable trend in the recent Dairy Industries exposition was the widespread use of aluminum paint on the parts of machines not fabricated from stainless metals. Manufacturers and dairymen expressed the opinion that the aluminum paint provides the necessary appearance of cleanliness that will encourage operators to keep their machines absolutely clean and enhances the appearance of the plant, a most important factor in this industry.

\$ \$ \$

Prevents Washing of Molds

Chromium alloy iron poured at high temperature was found to cut or wash the sand in the runner and gates of a small snap flask mold. To overcome this trouble, silica wash is sprayed over the runners and gates. To prevent any of this material from entering the mold cavities, a thin steel sheet is placed over the face of the mold. The sheet has an opening in the center sufficiently large to expose the gates and runners.

\$ \$ \$

Ignition Points for Wood

Recent tests reveal the relation between time and temperature in bringing wood to the ignition point. The ignition temperature of wood is in the neighborhood of 750 degrees Fahr. under conditions of rapid heating, according to *Safety Engineering*. The tests indicated that thoroughly dry samples may be expected to ignite under the following conditions: When held at 600 degrees Fahr. for about 2 minutes; when held at 500 degrees Fahr. for about 5 minutes; when held at 400 degrees Fahr. for about 20 minutes or when held at 340 degrees Fahr. for about 40 minutes.

\$ \$ \$

Plated Coatings Vary in Resistance to Corrosion

Investigating accelerated tests of nickel and chromium plating on steel, research workers of the national bureau of standards, Washington, recently drew some interesting conclusions. Both the exposure tests and the accelerated tests showed clearly that the protective value on steel of coatings consisting of the more noble metals, such as copper, nickel, or chromium, depends almost entirely on their freedom from porosity, while that of less noble metals, such as zinc and cadmium, is approximately proportional to the minimum thickness.

If it were possible to produce absolutely impervious coatings of the first group, especially of chromium, they would furnish permanent protection in most climates. Apparently the only practical method of approaching this goal is to make the deposits thicker, and even this method is not certain for chromium. Reliable tests for porosity may therefore be very useful for inspection, as they require much less time than the usual accelerated corrosion tests.

Steel Reinforcement Prolongs Life Of Bituminous Pavements

LONGITUDINAL rutting, transverse corrugations and cracks are troublesome features of bituminous pavements. Longitudinal rutting is due to the bituminous impregnated paving material being pushed sidewise by the pressure of the wheel loads continually following the same track in the traffic line. Transverse rutting is caused by heavy wheel loads pushing the road material forward and compressing it into ridges. Cracks are produced as the result of temperature changes.

Raking bituminous surfacing over reinforcing mat prior to rolling

Various theories are advanced to account for the regular corrugated form which is usually found in bituminous pavements. It is reasonable to believe that it is due to uniform compressibility of the material, although no particular theory has been universally accepted. Whatever the primary cause, it is obvious that the vertical movement is accompanied by a horizontal movement and any restraint to this horizontal movement will retard the vertical movement, thus retarding the corrugation of the pavement. The movement has been found to be almost entirely confined to the top 4 inches of all bituminous pavement.

By imbedding in bituminous pavements a rigid two-way steel mesh reinforcement which will resist horizontal movement, good results have been obtained in the elimination of ruts, corrugations and cracks. This method of reinforcing bituminous pavements has been in use since before 1920 in England, and since has been adopted in France, Belgium, Germany and other countries. It is now looked upon as a reliable and economical method of eliminating troublesome features of bituminous pavements.

In most instances, steel reinforcement has been used where it has been impossible to keep an unreinforced bituminous pavement in good

condition, without rebuilding it every two or three years. On numerous occasions one-half of the pavement has been built using steel reinforcement and the other half without. The results have been that the reinforced part of the pavement is in fine condition after eight or ten years wear and the unreinforced part has had to be replaced and has cost the taxpayer many times the cost of the reinforcement together with the inconvenience of maintenance.

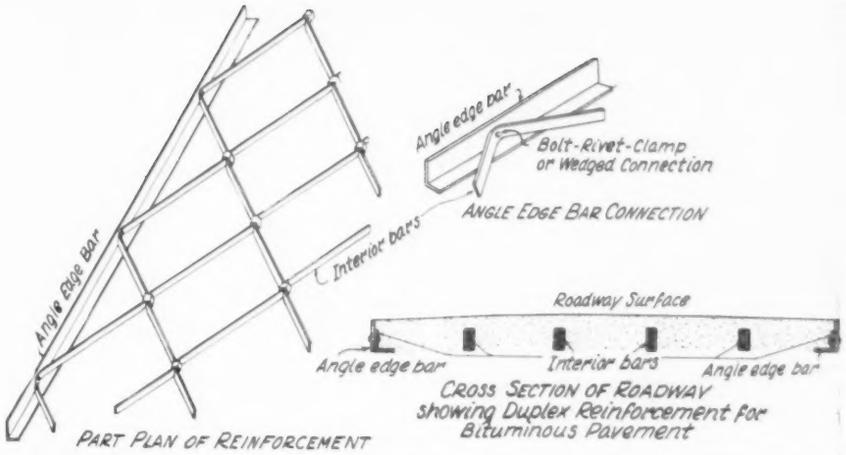
An important test under different conditions was carried out in the spring of 1922 in the borough of Wrexham, England. In this case considerable trouble had been experienced in maintaining the surface of a certain bridge approach which rested on a series of arches, the spandrel of which had been filled with clay and other materials, and with shallow depth in some cases between the crown of the arches and the road surface. These approaches were invariably in bad condition in spite of constant repair. The bridge itself was widened in 1922 and at the same time the approaches were slightly raised and reconstructed with reinforced bituminous pavement. Since that time there has been no sign of corrugation or wear, whereas previously repairs had to be carried out at frequent intervals, with consequent inconvenience to traffic.

Steel Bars Laced Into Mat

One type of steel road reinforcement is being fabricated by the Duplex Steel Re-inforcement Co., Liberty, Ind., with the Sharon Steel Hoop Co., Sharon, Pa., supplying the steel. This material has a rigid diamond shape mesh formation, made up of steel bars, edge set. The flat side of the bars offers high resistance to horizontal movement. Weight per hundred square feet is 78 pounds for 12 x 24 inch mesh, and 52 pounds for 18 x 36 inch mesh. The finer mesh is recommended for heavy traffic or roads built on a soft sub-strata, and the coarser for light traffic pavements with a firm foundation.

The method of placing this reinforcement in a bituminous pavement is not a complicated process. The roadbed is scarified, graded and rolled to the correct contour in the usual way. If 2, 2½ or 3-inch thickness of bituminous pavement is to be laid, the reinforcement is placed directly on the roadbed. If over 3 inches in thickness, the reinforcement is laid with its top 2 inches below the surface of the finished road. This is accomplished by placing the steel reinforcement on a bottom course which has been rolled down, and then laying the top course and rolling down to the correct contour.

The steel reinforcement is bent and shipped from the factory in nested bundles to the job, where it is fabricated at the roadside into rigid mats. Accompanying illustrations show how the reinforcement is clipped together and held at the sides by angle edge bars; also how the bituminous surfacing material is applied over the reinforcement. In fabrication, the steel clip connections are clamped tight with a mechanical air tool, forming a rigid mat the width of the road, and a length in accordance with terms of the contractor, unless specified by the engineer.



Sketch showing how ⅛ x ¾-inch steel bars are clipped together to form network of reinforcement for bituminous road surfaces

It may be necessary to stake down the mats if the crown in the road is unusually heavy, but in the ordinary type of construction it will require no anchorage. The bottom of the mats should not be more than 3 inches below the top of the finished roadway, otherwise it would be too low to perform its work effectively. It is found that bituminous pavements reinforced with this type of steel mat will not curl or push up in front of the roller as much as in unreinforced work, and time is thus saved in the rolling.

S. A. E. To Modernize Its Steel Specifications

The iron and steel division of the standards committee of the Society of Automotive Engineers, 29 West Thirty-ninth stret, New York, is engaged in a general review and revision of S. A. E. steel specifications. A brief announcement to this effect was made in the Aug 13 issue of STEEL, page 19. While the work has not progressed to the point where definite information can be released, it can be stated that the major part of the project is to modernize steel compositions.

Because so many changes have taken place in steel practice, it is realized that the time has come for more official recognition of new steels and discontinuance of some compositions which have passed out of general use.

The project involves the addition of several carbon steels throughout the range having higher manganese content and also the addition of several free-cutting steels, which, together with some modification of the present screw stock steels, will give a more complete line, including a high sulphur steel. Several new manganese steels are reported under consideration.

In the nickel-chromium series, a high chrome composition is being considered while a number of new molybdenum steels, including higher chromium and higher nickel types, are contemplated. In the silico- manganese series, a slight change is being made by substituting a 9255 for the 9250 steel. The other steels remain quite largely as at present.

The division's program includes also a general review of the notes bearing on heat treatments and physical properties. A comparative table of hardness number systems is under consideration to replace the present data bearing on these systems separately. It is probable also that the definitions for heat treatments, etc., and the general notes and instructions on the steel specifications as a whole, will be reviewed and brought up to date by a special editing committee which has been appointed under the division, but this work naturally will be the last to be undertaken, as it will depend largely on the modifications which are made throughout the general specifications.

Spray Hard Facing Alloys?

Efforts now are being made to roll hard facing alloys down to the fine wire diameters which are required for feeding metal into molten metal spray guns. The purpose is to make it possible to apply hard faces by means of the spray gun.

Buffing the interior of a stainless steel milk tank, using a 2-horsepower flexible shaft machine with special buffing disks

Grinding Welds in Stainless Steel Demands Special Care

BY E. P. GRISMER
R. G. Haskins Co., Chicago

GRINDING, sanding and finishing of welds, especially welds in products made from corrosive and heat-resisting alloys (stainless steel), presents problems worthy of more than ordinary consideration. Grinding processes on ordinary welds that do not require perfect blending of the weld with the surrounding metal are rather simple, as all that is usually required is to cut down the height of the weld to the approximate level of the surrounding metal, using an ordinary snagging wheel of vitrified or organic bond.

Small welded pieces that are easily handled usually have welds ground on stationary grinding equipment. Many fabricated metal pieces, however, are so large, bulky or heavy that it is necessary to bring the tool to the work; flexible shaft machines have been found efficient in this type of grinding. A typical finishing operation on an ordinary welded part, such as a frame for a refrigerator box, is as follows:

The amount of metal (weld) to be removed depends entirely upon the efficiency of the welding apparatus and the care of the operator. Assuming that the welds have been properly executed, it is first necessary to snag off most of the rod metal with a true running vitrified or organic bonded wheel. Avoid chatter in the wheel or spindle supporting the wheel and do not grind lower than just above the elevation of the surrounding metal.

Sanding Next Operation

Next take a well balanced sanding drum or wheel fitted with emery sleeves or belts and sand down the well elevation as desired. Where the presence of swirls (circular scratches) is not objectionable, fiber-back sanding disks mounted on flexible backing pad on right angle head drive will give excellent results and increased production at low cost. Sanding disks will cover more work area, whereas drums and sanding wheels have only point contact the width of the weld.

As previously mentioned, the finishing of welds in stainless steels presents a different problem. With the development of commercial sheets of stainless steel alloys came a great demand for this material for use in fabricating food cabinets, ice boxes, sinks, tables and other equipment. Due to the newness of this type of steel, practically no information was available on welding, drawing and fabrication of this metal. Many disappointments were experienced in the early days of stainless steel use. Welds were made improperly, grinding was difficult, finishing of the welded area to match the surrounding surface was nearly out of the question.

Grinding, sanding and polishing engineers were called upon to help solve the mysteries of this new metal. Results of exhaustive tests made by one of the large manufacturers of abrasive disks and sleeves finally solved the finishing process using a multispeed countershaft drive flexible shaft machine and numerous newly developed sanding and polishing mediums.

Welding Technique Explained

The following process has been found successful in handling welds in this metal:

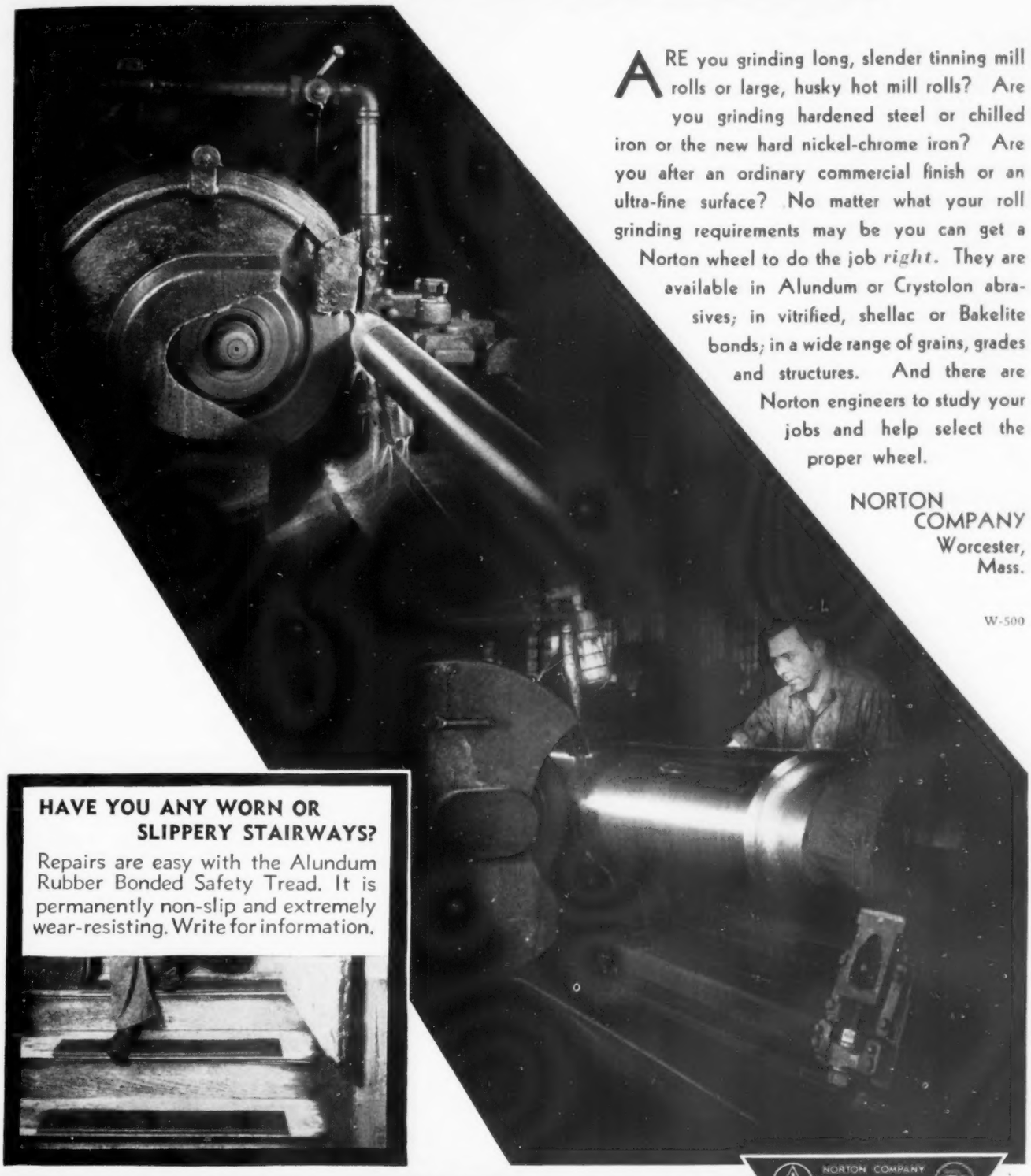
To produce a weld that will not rust or discolor and is easily worked, the operation must be executed with a minimum amount of oxygen in or around the flame. If the same proportions of oxygen and acetylene are used on the above mentioned alloys as on carbon steel or cast iron, a hard and difficult-to-work weld will result and it will invariably rust or discolor. Therefore, the oxygen at the torch tip must be reduced to a minimum that will just provide sufficient heat to cause fusion. This point is below the neutral and is called a carbonizing or reducing flame. Excess oxygen or a flame regulation which would be considered good for carbon steel would produce a hard and somewhat porous result on stainless steel.

Not as much difficulty is experienced from electric welding as with acetylene, but the quality of the electric weld can be increased by surrounding the hot ends of the rod with nitrogen gas.

If an acetylene weld has been properly executed with a minimum amount of oxygen present in the flame, it should have a soft silvery appearance and free from any "blow" or pits, and the weld "rolls" should not be any harder than the untouched portion of the metal. Assuming that this is the case, the roll should be from 1/32-inch to 1/16-inch in height, but sometimes through carelessness on the part of the welder, the weld will be much higher than this.

In finishing these welds, first grind down all high sharp edges of welded metal rod to a point within 1/16-inch of the surrounding metal using a standard vitrified or organic bond emery wheel mounted on the straight spindle of the flexible shaft machine. Next replace the grinding wheel with a 6-inch x 1½-inch face true running sanding wheel fitted with 60-grit

ROLL GRINDING WHEELS



ARE you grinding long, slender tinning mill rolls or large, husky hot mill rolls? Are you grinding hardened steel or chilled iron or the new hard nickel-chrome iron? Are you after an ordinary commercial finish or an ultra-fine surface? No matter what your roll grinding requirements may be you can get a Norton wheel to do the job *right*. They are available in Alundum or Crystolon abrasives; in vitrified, shellac or Bakelite bonds; in a wide range of grains, grades and structures. And there are Norton engineers to study your jobs and help select the proper wheel.

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abrasive band. Proceed to level off the weld to a point just above the surrounding surface. Follow this with a 120 or 180-grit abrasive band, reducing the elevation of the weld just down to the surrounding area of unworked metal. Closely observe the original grinding lines in the metal and follow these whenever possible.

Next, load the abrasive band on the sanding wheel with tallow, being sure that the tallow is evenly distributed over the entire working face of the band. This loaded abrasive will match the original surface of the sheet but judgment must be exercised in selecting the final grit number of abrasive that will correspond to the original surface of the sheet. This varies but the selection should fall between grits 120 and 180.

The sanding wheel should be manipulated in such a manner that the grinding lines will be in a parallel direction with the orginal lnes. The quality of finsh resulting and the extent that it matches with the original depends entirely upon the grit selection and careful manipulation of the wheel.

In order to remove scratches and tool marks on fabricated sheets the following precautions should be observed:

Consistent with the original finish of the sheet select a fine grit abrasive band (120 to 180). Load this abrasive with tallow as described above and apply carefully to the scratched surface using a light pressure just sufficient to keep the wheel from bouncing. Work a considerable distance from either side and end of the scratch so that the ground area will taper off gradually into the rest of the surface. This operation does not vary in any way from that in reducing a weld, except that more attention should be given to pressures so that no more stock is ground off than just necessary to arrive at the bottom of the scratch or mark. For cleaning off a worked surface use whiting and a soft rag.

Retoning Entire Surface

Sometimes it will be necessary or desirable to retone the entire surface of some particular piece of work. This is usually the case when there are several spots that have been reworked and welded. For this operation use abrasive paper in grits from 150, lubricated with sanding liquid mixed with water about 15 to 1. With a rubber rubbing block faced with this abrasive, the operator covers the entire surface of the work stroking in one direction and following the original grinding marks. Whenever a right angle joint is reached, the stroke terminates at the joint and is resumed at the opposite side of the angle. This operation is rapid and if care is used in keeping the strokes parallel with each other, a beautiful finish results that is absolutely uniform. The duration of this operation depends wholly upon conditions of the surface and should not require any more time than is just necessary to re-cut the metal uniformly.

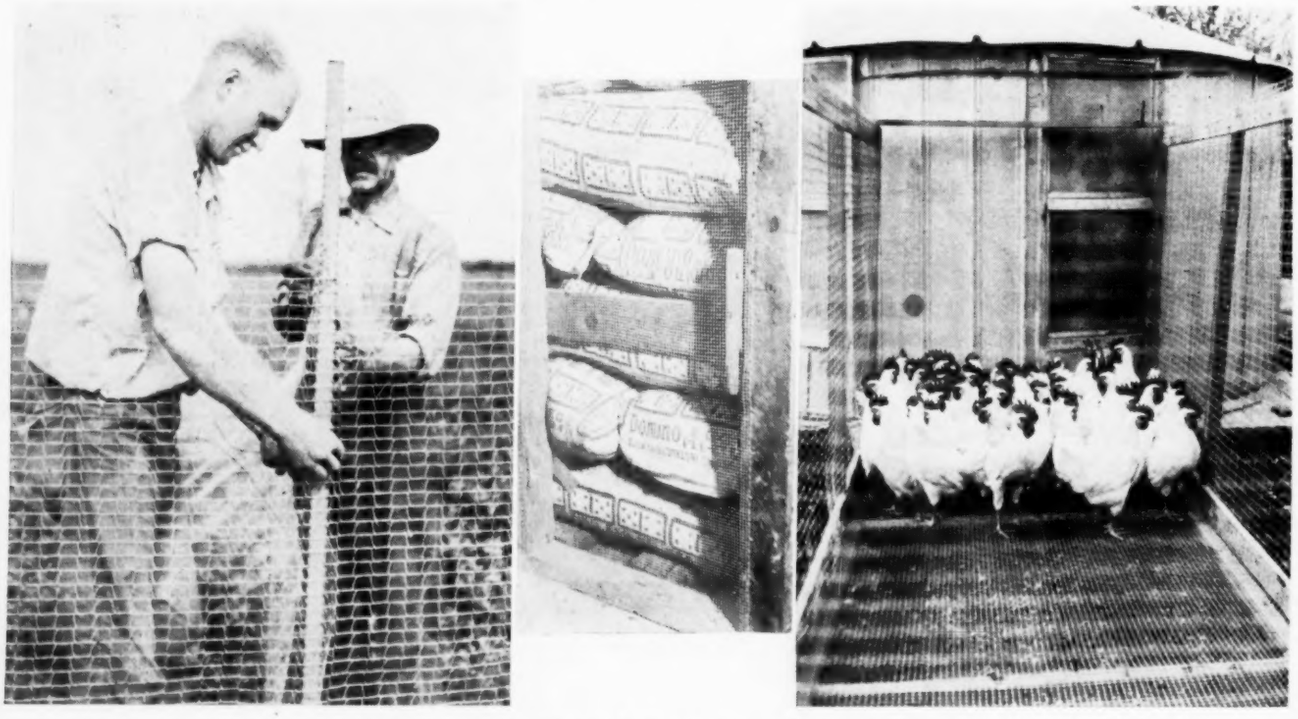
New Process Cleans Steel For Long-Lived Coatings

A new process in which cleaned steel surfaces are treated so that paints or other finishes will cling to the surfaces tenaciously has been developed by the American Chemical Paint Co., Ambler, Pa. Cromodine, a crystalline material supplied by the company, is dissolved in water contained in a stainless steel tank, heated with coils to a temperature of 170 to 180 degrees Fahr. Two rinse tanks, of steel or wood, also are required; the first contains cold water which overflows freely, while the second contains hot water.

After cleaning off oil and rust, the steel is immersed for a minute in the heated solution and then rinsed first in the cold water and finally in the hot water in order to hasten drying of the surface. A tack rag wipe is employed to remove the powdery residue left on the surface after drying, after which the treated surface is ready to receive paint primer.

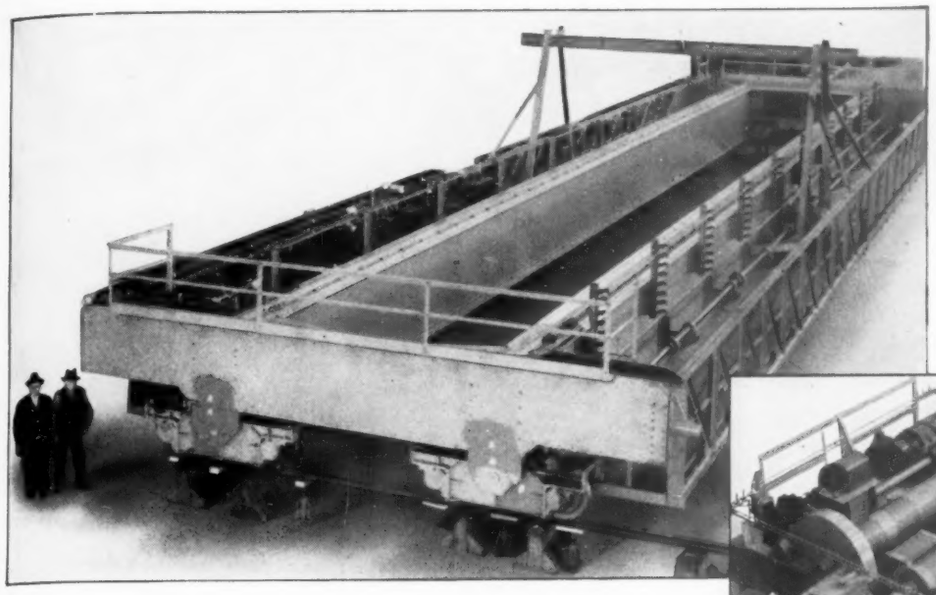
This new process will cost approximately 10 cents per 100 square feet of surface treated.

Poultry Industry Is Large User of Wire

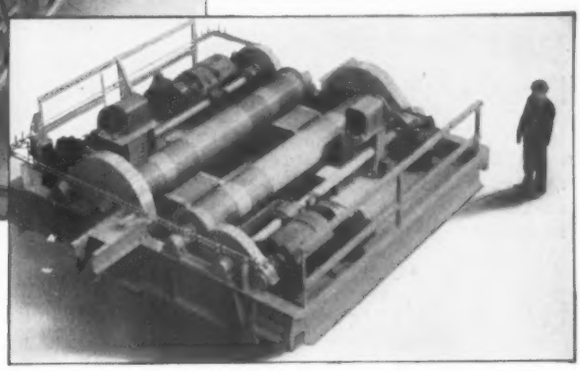


POULTRY WIRE IS INDISPENSABLE IN RAISING CHICKENS: Erection of "chick-tight" fence on one of Missouri's leading breeding farms is illustrated at the left; closely woven fences of this type are used extensively. Heavy ½-inch mesh hardware cloth is used for flooring on the sunporch shown at the right to avoid contamination from dirty litter. In the center is shown a feed storage room rat proofed with wire. Photos courtesy of Poultry Tribune

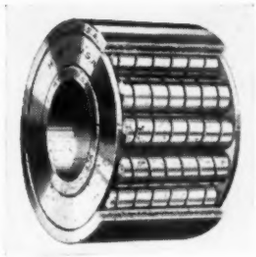
TWO-FOLD PROTECTION



THE CLEVELAND CRANE & ENGINEERING COMPANY, WICKLIFFE, OHIO, built this 15-ton 100-foot Span Crane for the NATIONAL TUBE COMPANY. All bearing locations are Hyatt.



There are more steel mill traveling cranes equipped with Hyatts than all other makes of anti-friction bearings combined.



When you think of better design and better performance, it is not difficult to associate these better bearings. For after all that's what the application of Hyatt Roller Bearings accomplishes.

In the design of equipment Hyatt Roller Bearings exactingly and progressively meet all requirements. In operation, no matter how severe the service, they protect the vital working parts from wear and care.

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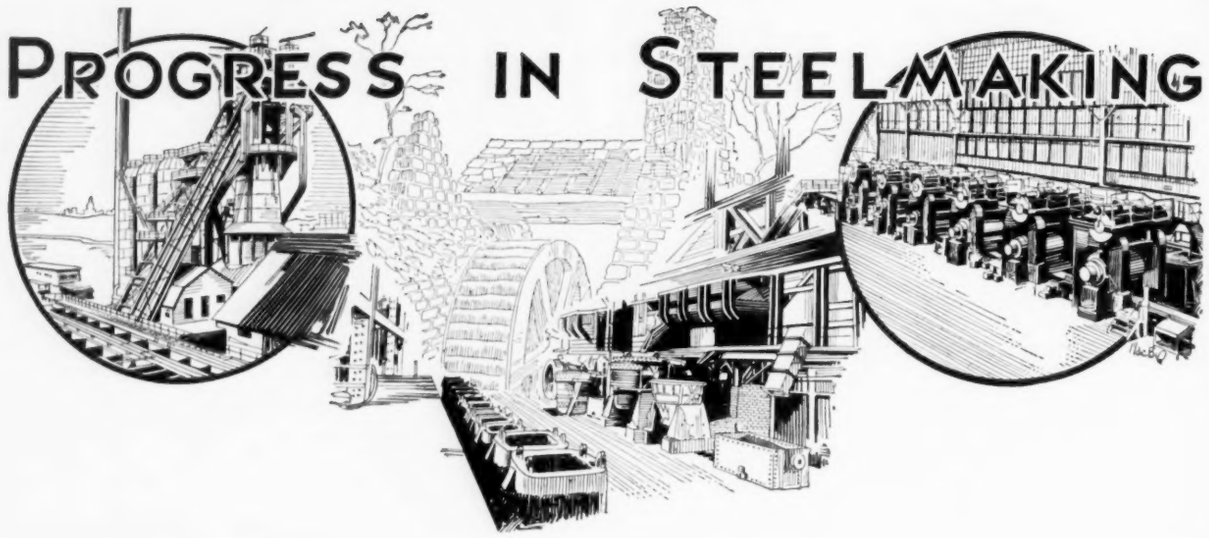
HYATT

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

PROGRESS IN STEELMAKING



Furnaces Are Top Charged

Three new arc melting furnaces of small capacity now being installed by a Michigan steel producer differ from standard electric furnace construction through a top charge feature.

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Prolongs Valve Campaign

One of the most recent developments, which promises to effect widespread economies in the iron and steel industry, is the hard-facing of gate and globe valves for high-temperature, high-pressure steam service. The nonferrous alloys of cobalt, chromium and tungsten are not only nongalling and resistant to wire drawing, but also are resistant to corrosion and erosion and because of their red hardness, are particular adaptable for this type of service. Gate and globe valve seats and disks faced with a nonferrous alloy outlast usual seating materials six to ten times.

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Why Copper Is Employed

Pole connectors made of oxygen-free copper now are being employed in motors which drive drop forging hammers on account of their ability to resist vibration.

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Results Are Encouraging

Scale on the exterior of annealing box covers have been a problem to sheetmakers for many years. At one sheet mill in this country an effort is being made to reduce this scaling by alumetizing. This consists of spraying a coating of aluminum about 0.010-inch thick on the sides of the cover and about 0.020-inch on the top. The box then is covered with potassium silicate (water glass) before the initial heat. Water glass protects the aluminum from the high flame temperature of the furnace and gives it an opportunity to alloy with the iron. Alumetizing is accomplished while the box is in normal service. The aluminum oxide formed on the exterior protects the cover and greatly reduces the rate of scaling. Results thus far obtained on a trial box are encouraging.

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Speeds Crane Lubrication

Labor required to oil the bearings of overhead cranes is reduced fully 90 per cent by centralized lubricating systems. At a steelworks ten oilers were unable to service the bearings of the ladle crane within 30 minutes whereas with a centralized system one man can lubricate all the bearings in less than 5 minutes.

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Oxygen Piped Through Mill

Considerable savings are effected at a Pennsylvania steel plant by piping oxygen from a central station to the various points of consumption. The oxygen is purchased in liquid

form, a tank load being equivalent to 50,000 cubic feet. Compared with the method of handling the gas in cylinders the foregoing arrangement obviates the labor charge involved in handling and changing the tanks as well as the loss of oxygen in the tanks when empty amounting to about 6 per cent of the original charge. The gas, which is metered to the various departments for the purpose of measuring their efficiency, is used for deseaming ingots and slabs, for pantograph cutting and for nicking ingots. Torch operators are paid a bonus based on the quantity of gas used. Ingots weighing 1200 pounds are nicked and broken in two 600-pound sections. Not only is a saving in pouring cost realized by this arrangement but inspection of the cross sections also is afforded.

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Paint Prevents Corrosion

Protection against rusting is afforded steel by a new resin-like paint, the base of which is prepared by chlorinating rubber. Its stability, fire-resistance, inertness to chemical attacks, solubility in solvents, ready miscibility with plasticizers make it highly suitable for use at steel plants. The paint which can be sprayed, brushed, or dipped is said to resist 5 to 95 per cent sulphuric acid and dilute hydrochloric acid. Strong adhesion to concrete is claimed for the coating and, because of the toughness of film, it is resistant to abrasive influences.

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Circuit Closed by Brush

Actuating the kickoff mechanism used for transferring bars from the runout table to the cooling bed is accomplished at an eastern plant by a simple device. Near the end of the runout table a wire brush with the back made of copper plate is mounted on an insulated bracket. The bristles extend slightly above the runout table. When bars in transit over the runout table make contact with the bristles, a circuit to an electric solenoid is closed, which in turn causes a clutch to become engaged and the kickoff member to function.

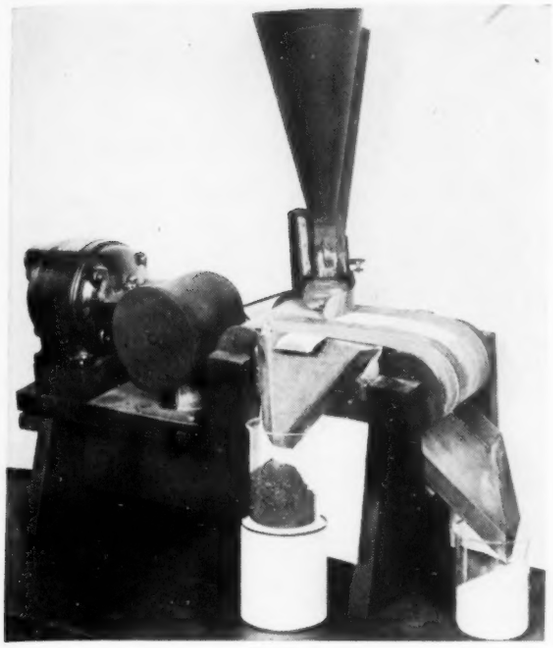

FIG. 1—Laboratory model of belt-type alternating-current magnetic separator. Material is fed into the hopper, falls onto the inclined belt beneath which the magnet is set. Concentrates fall down the chute at the front. Photo courtesy bureau of mines

New Magnetic Separator for Concentration of Ores

BY C. W. DAVIS*
Associate Chemist, Bureau of Mines, Pittsburgh

AN ALTERNATING-CURRENT magnetic separator of good capacity and low energy requirement which causes individual magnetized particles to jump away from waste matter and produce a superior concentrate has been jointly developed by R. S. Dean, chief engineer, metallurgical division, and the writer as a by-product from the study of mineral physics being conducted by the bureau of mines, Pittsburgh.

Commercial magnetic separators at present use direct current to produce magnetic fields of sufficient strength and concentration either to pick up or deflect those particles having adequate magnetic susceptibility. When the susceptibility is high and the field strong enough to pick up the particles they are attracted to each other as well as to the magnet pole and tend to entrain or entangle a considerable amount of foreign matter, especially when finely divided material is being treated. When the susceptibility of a material is low the force effecting its deflection is weak, even in fields of high intensity, so that magnetic separation under these conditions is accomplished at comparatively slow feed rates, with low resultant separator capacity.

The new separator uses alternating current of the ordinary frequencies (60 to 120 cycles) to produce a relatively low field strength (about one-half that of the coercive force of the mineral being treated) and effects rapid separation of the magnetized particles.

The principle of operation is based on the fact that whenever a magnetized particle resting on a surface over one pole of an alternating-current electromagnet finds itself in a position such that its resultant direction of easy magnetization is not parallel to the direction of the field, the particle pole which differs from the magnet pole tends to become attracted but its motion in that direction is prevented by the surface; the other pole of the particle being of the same polarity as the magnet pole is simultaneously effectively repulsed. Consequently the particle "jumps" from the surface each time the reversing field catches it in a position of preferred orientation. The random agitation of magnetized particles causes them to pass individually down a sloped supporting surface and become separated from other particles which lack remanent magnetism to effect their repulsion or which are so deficient in coercive force that the polarity rather than the position of the particles changes in unison with the field.

Two Types Designed

Two varieties of alternating-current magnetic separators, the belt type and the drum type, seem especially suitable for the concentration of ores. The operation of the belt type machine is readily understood by reference to Fig. 1, which shows a laboratory model of a separator that is to be demonstrated at the meeting of the American Association for the Advancement of Science in Pittsburgh, Dec. 27. The material to be treated is fed from the hopper to the belt surface, which passes to the right over a magnet. The pulleys over which the belt passes are inclined so that the upper belt surface is

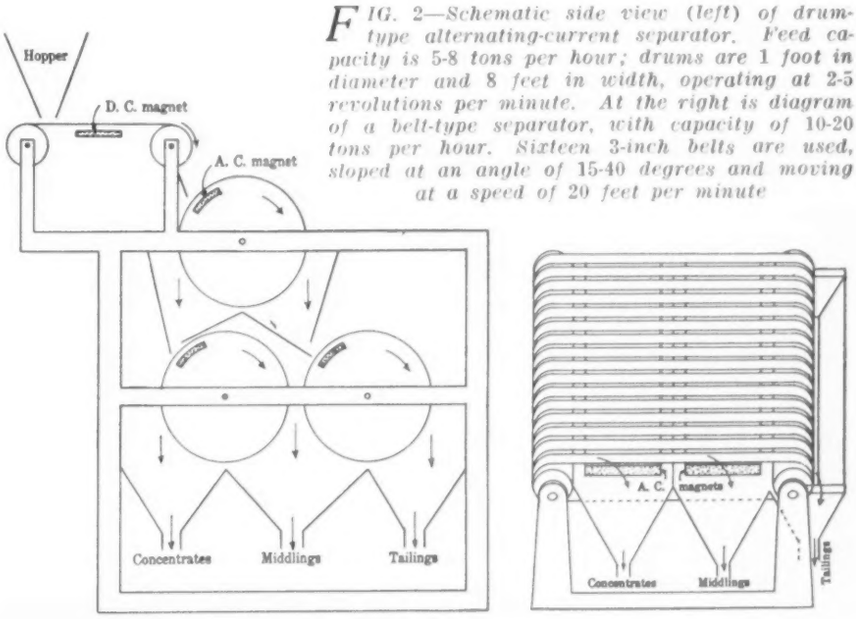

FIG. 2—Schematic side view (left) of drum-type alternating-current separator. Feed capacity is 5-8 tons per hour; drums are 1 foot in diameter and 8 feet in width, operating at 2-5 revolutions per minute. At the right is diagram of a belt-type separator, with capacity of 10-20 tons per hour. Sixteen 3-inch belts are used, sloped at an angle of 15-40 degrees and moving at a speed of 20 feet per minute

*Published by permission of the director, United States bureau of mines.

sloped transversely downward toward the front. This causes the material of high coercive force to jump down the slope and collect in the container shown in the foreground. Other particles stay on the belt surface until discharged at the pulley and fall into the container shown at the right.

A commercial machine of this type could be constructed so as to have many parallel belts passing over two pulleys, as shown schematically in Fig. 2, where two magnet systems of different strength are arranged to produce three different products, such as a concentrates, middlings and tails. Capacity of such a separator with 16 belts having an overall size of 5 by 5 by 4 feet has been estimated by extrapolation from a laboratory machine to be from 10 to 20 tons per hour.

The operation of a drum-type alternating-current separator is shown graphically at the left in Fig. 2, where the material passes first over a direct-current magnetizer and then drops on a rotary drum surface, beneath which a stationary alternating-current magnet is supported, in such a way that the particles with high coercive force pass down the surface in a direction opposite to that of the movement of the drum surface carrying the other particles, thus effecting a separation.

Lodestone may be separated at once on alternating-current separators and certain other minerals are capable of such separation after exposure to a direct-current magnetic field, but for the sake of greater capacity and more positive separation it is usually preferable to use a preliminary heat treatment to improve the magnetic properties of the mineral in question. Although heat treatments may be regulated so as to make almost any mineral containing substantial amounts of iron, nickel or cobalt susceptible to alternating-current separation, the practicability of such treatments must be determined separately for each case as it arises.

Concentrate Iron Ores

Iron ore that has been subjected to a so-called "magnetic roast" (involving partial reduction) is ideal for alternating-current separation, and many hematites contain sufficient reducing agents to bring this about by merely heating in closed containers at 600-700 degrees Cent. for about 15 minutes. A simple "flash roast" in which ore is subjected to a high temperature for a fraction of a minute gives good results with hematite, pyrite and hydrated iron oxides, but more complicated treatments are involved in the conditioning of such minerals as chromite, ferberite and franklinite.

The few representative results given in table I, together with others, indicate that alternating-current separation has distinct possibilities for the future enrichment of low-grade ores and the purification of high-grade products.

A.S.T.M. Coal and Coke Standards Are Segregated

A.S.T.M. Standards on Coal and Coke; paper 108 pages, 6 x 9 inches; published by American Society for Testing Materials, Philadelphia; supplied by STEEL, Cleveland, for $1 plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Committee D-5 of the American Society for Testing Materials has prepared this first compilation of all the standard and tentative specifications for coal and coke as issued by the society. Five specifications, 13 methods of test and the standard definitions of terms are included.

An important feature is presentation of methods of laboratory sampling and analysis of coal and coke and procedure for sampling coal and coke for analysis. Tests include standard determination of cubic foot weight of coke and crushed bituminous coal, sieve analysis, shatter and tumbler tests for coke, determination of cell space of lump coke and testing for size of anthracite.

Table I

Examples of Magnetic Concentration with Alternating-Current Magnetic Separators

Ore, description	Treatment	Products: Description	Products: Composition, per cent	Recovery, per cent
Limonite in barite, intergrown, 50% Fe	Crushed -28 mesh; flash roast 1400° C. Separated on belt type A.C. machine after activation	Concentrates Concentrates	57.88 Fe 61.44 Fe	Fe, 90.4 Fe, 85
Iron ore magnetically roasted, 38.0% Fe	Oxidizing roast 5 min., 600° C. Separated on belt type A.C. machine	Concentrates Concentrates	60.2 Fe 60-61 Fe	Fe, 81.8 Fe, 90*
Waste product, Rheolaveur plant, 35.0% Fe	Crushed -28 mesh, standard magnetic roast, A.C. separated	Concentrates Middlings Tails	65.4 Fe 6.0 Fe 1.3 Fe	Fe, 94.8 Fe, 4.2 Fe, 1.0
Hematite ore, 48% Fe	High intensity activation, A.C. separated	Concentrates Middlings Tails	66.1 Fe 42.4 Fe 5.3 Fe	Fe, 84.6 Fe, 10.3 Fe, 5.1
Chrome-iron ore, olivine gangue, 50.46% Cr_2O_3	Crushed to -100 mesh, oxidizing roast 900° C., standard magnetic roast. A.C. separated, belt-type machine	Concentrates Middlings Tails	59.1 Cr_2O_3 47.0 Cr_2O_3 12.0 Cr_2O_3	Cr_2O_3, 79.6 Cr_2O_3, 16.5 Cr_2O_3, 3.9
Chrome-iron ore, 35% Cr_2O_3	Crushed to -100 mesh, oxidizing roast 900° C., standard magnetic roast. A.C. separated, belt-type machine	Concentrates	63.3 Cr_2O_3	Cr_2O_3, 67
Ferberite, 25% WO_3	Oxidizing roast 950° C., then reduced 600° C., crushed to 28 mesh. A.C. separated	Concentrates Middlings Tails	61.0 WO_3 19.8 WO_3 1.9 WO_3	WO_3, 73.2 WO_3, 23.8 WO_3, 3.0
Cobalt ore, 1% Co	Reduced in CO at 300° C. 30 minutes, crushed to 60 mesh, A.C. separated	Concentrates 1st Middling 2nd Middling Tails	21.2 Co 3.86 Co 0.30 Co 0.11 Co	Co, 73.5 Co, 17.6 Co, 5.1 Co, 3.8
Hematite, 1.6% S	Heated 500° C. in closed container. Activated and A.C. separated	High Hc Low Hc	0.82 S** 2.3 S	Fe_2O_3, 70.6 Fe_2O_3, 29.4

*The present method of treatment for this ore (Grondal drums) is said to result in an 85 per cent recovery in the form of a 56 per cent product.

**This sample had failed to show any segregation of sulfur by direct current magnetic separation or by various other ore-dressing treatments.

Clay Gun Stops Iron Notch Under Full Blast Pressure

TAP holes of blast furnaces, a few decades ago, were stopped with a hand-swung and hand-guided steam-driven clay gun, the stopping operation frequently resulting in many accidents and occasional loss of life. With this type of gun it was necessary to take the wind entirely off the furnace when stopping the hole, which required from 5 to 20 minutes from the time the snort valve was opened until the pressure was back to normal again. This caused a slowing up of the melting in the furnace, with the result that it might be 45 minutes and longer before the furnace again was operating as it had been before the wind was checked.

In 1917, however, a steam-operated single-barrel automatic clay gun was introduced by Edgar E. Brosius, Pittsburgh. With this gun the blast was reduced to a pressure of about 5 pounds per square inch for a period of from 30 to 40 seconds during the plugging of the hole. This practice prevented much of the slowing up of the furnace and thus resulted in a more regular operation and an increased production. This gun also eliminated the necessity of any member of the crew being in the danger zone during the plugging operation, as the raising of the splasher plate, the swinging of the gun into the trough, the clamping of the gun in position, and the discharge of the clay were controlled from a manifold located on the cast house wall away from danger. If additional clay were required to stop the hole, however, it was fed into the clay barrel by hand. Eighty-seven blast furnaces were equipped with this type gun.

Employs Double Barrel

In order to overcome the objection of having a man feed the extra clay and allow for stopping the hole with higher wind pressures, the Brosius steam-operated double-barrel automatic clay gun was brought out in 1926. This gun was equipped with two clay barrels, each actuated by its own steam cylinder. These barrels had a total capacity of 2¾ wheelbarrow loads of clay which, under ordinary conditions, was sufficient to maintain a long tapping hole on the largest blast furnace. With this increased clay capacity, all danger was removed from the stopping operation, once considered one of the most hazardous tasks in connection with blast furnace operation. Not a single man was required on the furnace front, as all operations were controlled from the cast house wall. In case of emergencies, the hole could be stopped under full pressure and with the iron flowing full. This was done many times, resulting in great savings. A total of 102 stacks were equipped with this type gun.

Steam Was Objectionable

Some blast furnace operators did not like the use of steam on the furnace front, and to overcome this objection, the Brosius hydro-electric clay gun, shown in Fig. 1, was designed in 1929. This gun also has two clay barrels, but all motions are actuated by an oil pump direct driven by a 20 horsepower motor located outside of the cast house, away from danger of breakouts, etc. The lifting of the splasher plate, the swinging of the gun into the hole, the clamping in position, and the discharge of the clay are, as in the steam guns, controlled from a manifold located on the cast house wall, away from all danger, and no men are required in the danger zone while the hole is being stopped. Blast furnaces equipped with this type gun total 19. Stopping the hole with full pressure is common practice, resulting in increased iron production and the maintenance of a steady gas volume and pressure.

Design 2-Motor Gun

To meet the modern trend of electrifying all equipment, the Brosius two-motor automatic clay gun, shown in Fig. 2, was developed in 1933. This gun has a single clay barrel, but the barrel has a capacity of 9 cubic feet which is more than ample to meet any condition. Under normal conditions only a third of this clay is used to stop the hole.

A distinctive feature of the electric gun is the elimination of the clamping mechanism. The gun is pulled into the hole and positively held in position by a flat rope attached to the furnace front and wound on a nonreversing (except by motor) worm gear winch operated by a 10-horsepower motor mounted inside the boom; the splasher plate automatically is raised as the gun swings in. Clay is discharged the moment the gun is in the hole. The iron notch is stopped completely in from eight to 12 seconds, depending on the amount of clay required. The

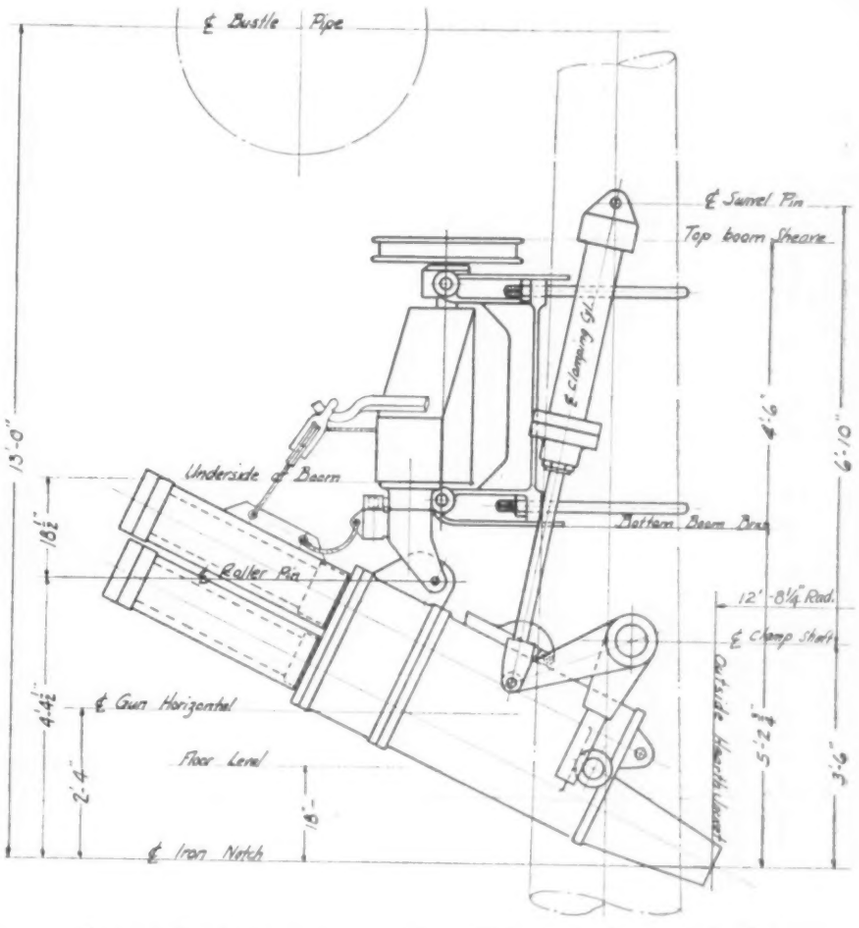

Fig. 1—Elevation of electric oil operated double barrel clay gun

hole is stopped under full blast pressure and no one is required in the danger zone at any time. The entire equipment is controlled through a simple and inexpensive control located at any convenient point in the cast house. The gun proper of this new two-motor equipment is driven either by a straight mechanical gear drive or by a self-contained motor-driven hydraulic oil gear unit, this unit and its driving motor being mounted directly on the gun.

Savings to be effected by the use of an automatic clay gun, are based on the following assumptions:

Furnace production, tons....	500
Coke consumption per ton iron, pounds	2,000
Gas production per 24 hours, cu. ft.	71,500,000
Gas available for boilers, cu. ft.	50,050,000
Gas to boilers per hour, cu. ft.	2,083,000

If the wind is off the furnace during five periods of three minutes each from the time the blast first is checked until full pressure and normal melting conditions return, 49,528,600 cubic feet of gas can be utilized for the boilers. The gas loss, therefore, amounts to 521,400 cubic feet of gas per 24 hours.

As such a loss has to be met by some other fuel under the boiler, a total of 521,400 x 95 = 49,423,000 B.t.u. must be introduced under the boilers during the time the wind is off the furnace. Since a good grade of coal will run approximately 13,500, B.t.u. per pound, the total loss in coal will be 1.6 tons.

Each minute the blast is off the furnace, results in a melting loss of 0.34-ton of iron. Taking the wind completely off the furnace results in jamming of the stock and approximately 30 minutes transpire before normal melting is resumed. At least half of this 30 minutes results in lost time. Figuring 0.34-ton per minute and 15 minutes, there is a loss of 5.1 tons for each cast. On this basis a loss of 25.5 tons a day, or 765 tons a month can be assumed. The loss which arises when the iron notch is plugged after the iron is tapped and because of slow working after the cast then totals 4590 tons for a campaign of six months.

Losses Are Computed

Assuming the conversion cost of iron at $2, there would be a loss of $9180 in a six month period. With coal at $2.50 a ton, a saving of 1.6 tons per day would amount to $4, or $120 per month, or $720 for a six month period. Adding this to the conversion cost of $9180, there is a total loss of $9900.

If it requires only three minutes to get the wind off and back on the furnace, good work is being done, as in most cases it is considerably longer and consequently the loss in coal used is considerably larger.

Assuming that these figures are 25 per cent too liberal, and there is no reason to believe they are, the savings accomplished still can pay for the gun in practically six months.

The foregoing savings do not take into account any money saved by being able to make emergency stops with a full stream of iron flowing, which, as has been experienced in some cases, has more than saved the cost of the gun in the one plugging.

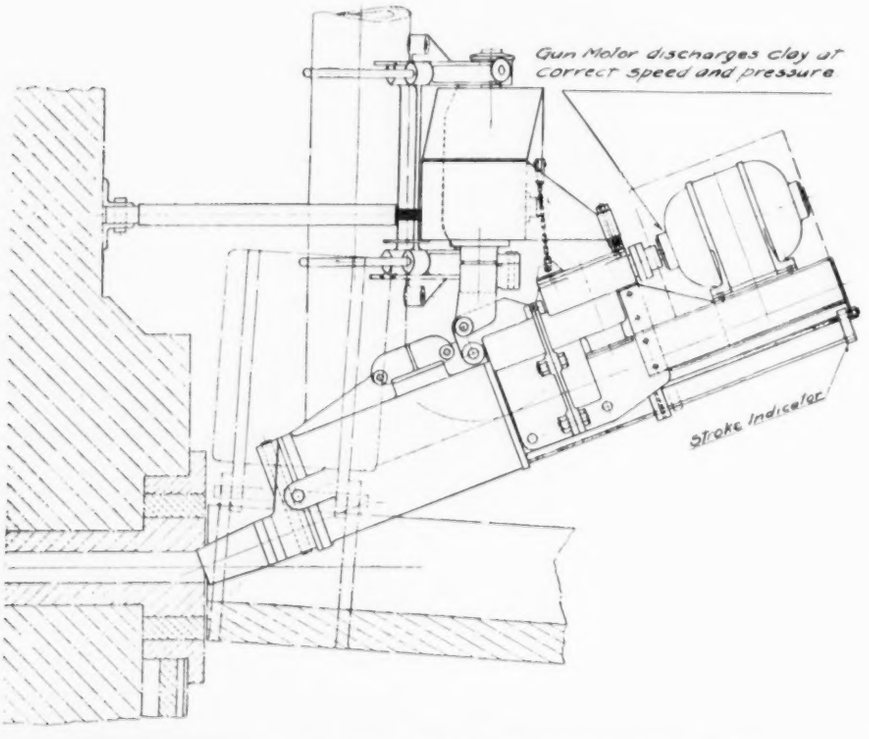

Fig. 2—Elevation of automatic mechanical motor-driven clay gun

Field for Die Castings Covers Wide Alloy Range

Die Castings, by Herbert Chase; cloth, 264 pages; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland for $3.50, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Many problems of the die casting industry are discussed in this book, which deals primarily with the product, its composition, uses and design, rather than with methods followed in production, although some of the latter are outlined briefly. The author has presented material from which the reader can form a better mental picture of the commercial and technical possibilties of die casting; set fortn the characteristics of various alloys suitable for die casting; compileu information needed for intelligent design; presented facts useful in specification, inspection and tests; and furnished an outline of types of finishes available.

The text has been written with the aim of supplying engineers, products designers, executives, students, and others engaged or interested in the metal working arts with the latest information on the subject. The aim has been to explain how die castings can be applied advantageously as component parts of various products and what alloys are best used. An exceptionally large number of illustrations show to advantage a wide variety of die-cast parts.

Suspension Bridges of Short Span Given Code

Suspension Bridges of Short Span; by F. H. Frankland; published by American Institute of Steel Construction, New York; supplied by STEEL, Cleveland, for $3.50, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

From extensive experience in design and construction of short-span highway suspension bridges, 700 to 800 feet, the author believes the true economics of design of such structures are little understood. Published information has been meager and this volume attempts to cover the science of suspension bridge design in the light of recent developments which have been recorded.

The basic theory of design is discussed and detailed comparison is made of elastic and deflection theories. Eight chapters cover design and erection. A chronological table of suspension bridges of short span, a bibliography and index complete the volume.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Industrial Filters — Motor Improvements Inc., 365 Frelinghuysen avenue, Newark, N. J., has announced a new line of Purolator filters which have proved their value in the filtration of such things, among others, as coolants on lathes and grinders, cup greases, compressed air, gasoline, paints, varnishes and lacquers, refrigerating fluids, waxes, and even acids.

These filters range in size from tiny units no more than 2 inches in length by ½-inch in diameter to huge castings nearly 6 feet in length and more than half this much in diameter. They are used in many machine shops to make possible the repeated use of the coolant liquid bath in which high-speed grinding tools operate and which formerly quickly became contaminated and unfit for further use.

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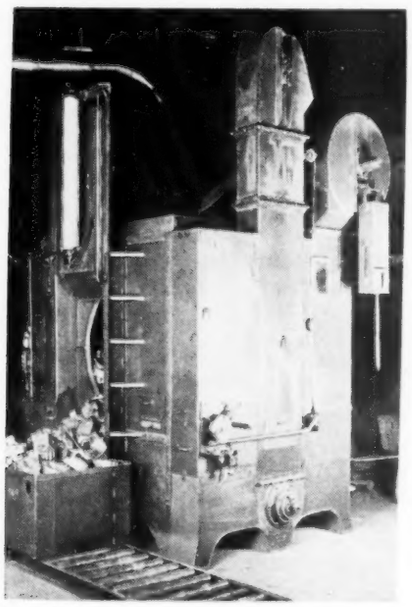
Centrifugal Blast Cleaning Unit—Pangborn Corp., Hagerstown, Md., recently has introduced a new centrifugal blast cleaning machine for castings of various sizes and shapes. The machine handles loads up to 18-cubic feet in bulk and averaging 2200 pounds in weight. Time required for cleaning varies from 7 to 15 minutes, depending upon the characteristics of the castings.

The interior of the unit has two revolving drums and a stationary armor plate strip through the center. Action of the revolving drums throws the castings into this center strip directly under the abrasive stream created by a revolving wheel.

Operation of the machine is simple. The loading door is opened and closed by a quick-acting, easily controlled cylinder. An electric measured time clock automatically operates a warning signal when cleaning is completed. Abrasive is used over and over again, being thoroughly cleaned and handled by a separator and elevator unit built into the equipment. The loading point of the machine is low, and by reversing the travel of the drum the load flows out of the machine into tote boxes. Wires and oversized materials are removed by nonclogging, self-cleaning, screen wheels.



Pangborn centrifugal blast cleaning machine has low loading point

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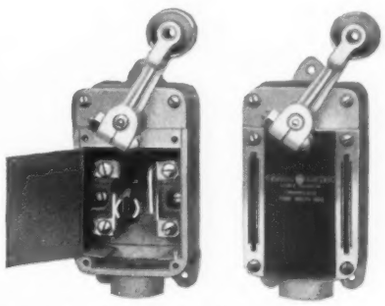
Track-Type Limit Switch—General Electric Co., Schenectady, N. Y., is introducing a small track-type, spring-return limit switch intended for use in making or breaking control or indicating circuits at a fixed point in the travel of a part of a machine or mechanism. The switch, shown herewith, and designated as CR9440-A1A, has one normally open and one normally closed circuit. Its maximum carrying and breaking capacity is 5 amperes at 550 volts alternating current and on direct current ranges upward from 0.4 amperes at 550 volts to 2.0 amperes at 115 volts.



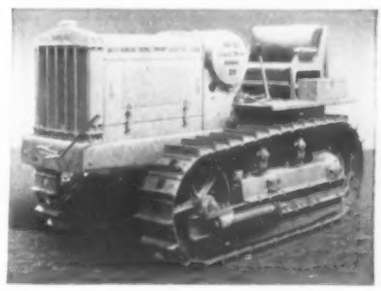
General Electric limit switch can be mounted at any angle

The new device is operated by an 18-degree movement of its operating arm from the normal position, an overtravel of 54 degrees being possible without causing damage to the switch. A precision mechanism on the operating arm affords simple, accurate adjustment of the arm to any position around the operating shaft. Double-break silver-plated contacts, opening and closing with a sliding motion, assure good electrical connections.

The switch, with the exception of its operating arm, is enclosed in a die-cast box 4 inches high, 2 7/16 inches wide, and 1 29/32 inches deep. Installation is simple. The operating arm moves in a plane parallel to the base of the switch; hence no right-angle mounting bracket is required.

♦ ♦ ♦

Tractor—Bates Mfg. Co., Joliet, Ill., recently announced a new model 35 tractor. In this unit, shown herewith, rear end engine vibration which often results from end play in wearing clutch parts, is eliminated, the manufacturer claims. The main engine clutch contains a unique supporting feature in that the weight of the clutch parts is supported midway of two bearings. This provides a sturdy support not to be compared with designs involving overhanging on one bearing. The transmission gear shaft extending from the clutch is supported on two bearings, one of which is the same bearing as is used on the clutch shaft. A gear type coupling is incorporated between the clutch shaft and transmission shaft so that the necessary flexibility is obtained between the two members and each bearing has its proportionate loading. The result is the clutch is held in proper clutch rotating balance.



Model 35 tractor of improved design built by Bates Mfg. Co.

In the crawlers, the housing supporting the track idlers has been extended to give greater protection to the drive sprocket. The wide track rail has been retained and through the installation of a specially designed electric furnace of the continuous type, uniform heat treating of track shoes has been made possible.

A deep leather upholstered seat has been moved back to provide more leg room. In its new location, the operator sits directly over the rear axle, thus riding on a pivoting point. Braking pressure of the steering brakes has been increased and the crawler can be stopped with a relatively light pressure of the foot. The

standard Bates brake lock is mounted on the left-hand brake pedal. By merely flexing the foot downward the tractor and its load can be held stationary on any hill position the tractor may be in.

Drag links between the steering clutch operating levers and the bell cranks on the clutches are adjustable at both ends. This permits maintaining the hand-steering lever and bell cranks in a constantly relative position regardless of the wear of the steering clutch faces, and in addition, takes up the wear of both ends of the drag link. The new model 35 tractor has a drawbar pull of slightly over 43 horsepower and can be powered for either diesel, oil, or gasoline.

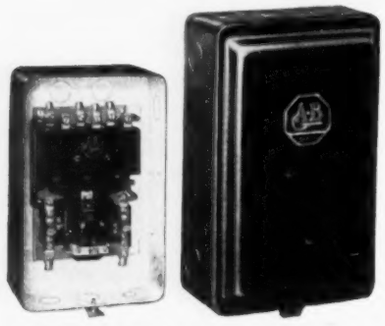
♦ ♦ ♦

Solenoid-Operated Switches — Allen-Bradley Co., 1311 South First street, Milwaukee, has extended its line of solenoid-operated starting switches to include the 50-ampere and 100-ampere ratings. The first size originally announced, is limited to 25 amperes. The two new switches will handle polyphase motors up to 15 horsepower, 110 volts; 30 horsepower, 220 volts; and 50 horsepower, 440-550 volts. These starters can also be used for starting single-phase motors that may be thrown across the line.

A patented arc hood completely encloses each contactor in an individual compartment from which arcing or heated gases cannot escape to cause flashovers. This switch, shown herewith, can disrupt, without difficulty, ten times the maximum rated current at listed voltage.

There is no concealed wiring. All terminals are plainly marked and accessible from the front of the switches. The double-break contacts dispense with flexible leads. Insulating oxides cannot form on the silver alloy contacts, and the contacts retain their high electrical conductivity without "dressing" or maintenance.

The pick-up and drop-out voltages



Allen-Bradley solenoid-operated starting switch

Portable potentiometer developed by Brown Instrument Co.

are low. These switches will close at as low as 70 per cent of rated voltage and will not drop open unless the voltage falls below 50 per cent of normal.

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Portable Potentiometer — Brown Instrument Co., Philadelphia, recently brought out a portable potentiometer designed to enable pyrometer users to check their potentiometers, millivoltmeters and thermocouples quickly and accurately. The combination of a step-switch and slide wire makes it possible to read the indicating scale to .01 millivolts over a total range of 71 millivolts. This step-switch and side wire combination is equivalent to having a slide wire 109 inches long. The indicating scale is 17 inches long, making the smallest scale division (.05mv) over 1/16-inch in width.

A fully enclosed, suspension type galvanometer is used. Having a short period (approximately 2 seconds) readings can be taken rapidly, as the galvanometer responds immediately when dial is moved to a new position. Two sets of binding posts and a toggle switch, provided for thermocouple checking, further facilitate taking check readings quickly and accurately.

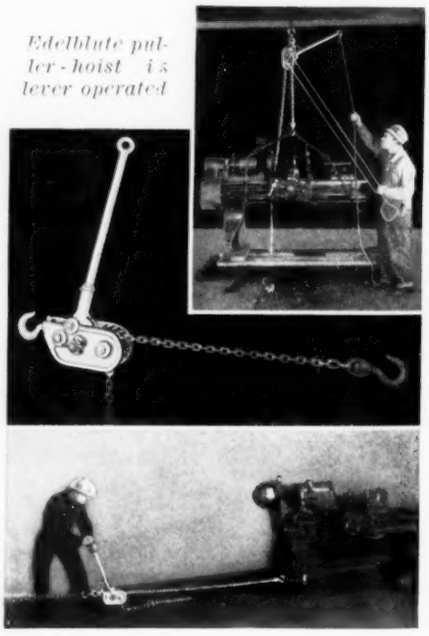
The potentiometer circuit has been designed primarily for checking pyrometers and thermocouples. In addition, this new portable potentiometer can be used as a measured source of E.M.F. in checking recording potentiometers of the self-balancing type. The circuit draws only three milliamperes from the dry cell. In addition to being simple in construction and extremely accurate, this new instrument, shown above, is small in size and light in weight. It is 9⅜ inches wide x 10¼ deep x 6¾ inches high, and weighs 12¾ pounds.

Combined Pulling Jack and Chain Hoist—Edelblute Mfg. Co., 359 Jackson street, Reynoldsville, Pa., has brought out a puller-hoist to fill the need for a pulling jack that also can be used for overhead vertical lifting. It is a lever-operated mechanism, employing simple principles of leverage, working on a ratchet-toothed chain sprocket wheel, and a load chain with a swivel hook.

The unit is automatic reversing, and the load can be pulled or lowered a notch at a time, by merely turning the "reverse latch" to its proper position. Hoisting speed is 2 to 4 feet per minute, according to the load. At present, it is made in one size only for a rated capacity of 1½ tons. The device can be handled easily and operated by one man anywhere. Hoist weighs only 29 pounds, and the 15 foot chain 16 pounds.

Primarily a pulling jack which can operate in any position, it has a wide range of uses around industrial plants for many odd jobs in maintenance, repair and construction work, in fact for any job for pulling, moving, lifting heavy loads. In addition, it can be used for vertical

Edelblute puller-hoist is lever operated



lifting, and can be operated and controlled, when overhead, as shown in the accompanying illustration.

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Brazing Flux—Handy & Harman 82 Fulton street, New York, has announced a new flux developed to speed up and improve brazing operations on either ferrous or nonferrous metals. It is particularly appropriate for use with "Handy" silver sold-

ers, "Sil-Fos" and "Easy-Flo" brazing alloys—products of this company. The new flux has a low melting point and permits taking full advantage of silver solders and brazing alloys having low flow points. Greater solvent action on a wide variety of oxides is said to be a feature that speeds up brazing and insures thorough wetting of joint surfaces at low brazing temperatures, making it possible

Tabor jar squeeze molding machine has overhead cylinder

to obtain strong and uniformly dependable joints.

This new flux is made up in paste form ready for use. It works efficiently over a wide temperature range, spreads rapidly over the work when heated with less tendency to ball up or bubble. It is recommended for brazing stainless steel, steel, monel metal, nickel, copper, brass, bronze and various other ferrous and nonferrous metals and alloys, and is sold in one-half, one and five-pound jars.

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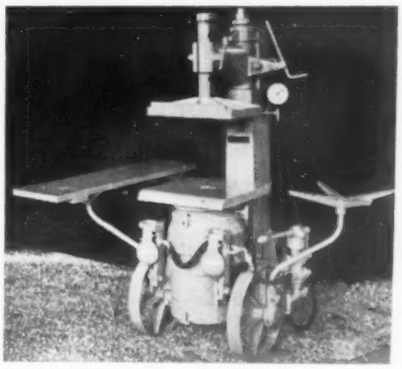
Jar Squeeze Molding Machines—Tabor Mfg. Co., 6225 Tacony street, Philadelphia, recently has introduced two jar squeeze molding machines. One machine, shown in the illustration directly above, has an overhead squeeze cylinder, 10-inches in diameter, with a table 16 x 19 inches. The upright member carrying the squeezing head is of chrome molybdenum alloy, instead



Column jar squeeze molding machine built by Tabor Mfg. Co.

of the 4-inch pipe previously used. The squeeze head is located centrally over the table of the machine and both the jar and vibration are controlled by knee-operated valves. Squeeze operation is controlled by a handle on the squeezing head of the machine.

A second type is a new column jar squeeze molding machine. The machine is portable and has a 10-inch squeeze cylinder in the base which also carries the jarring cylinder. Both jar and vibrator are operated by knee-controlled valves. It is claimed that the head of this machine may be operated easily and that it is swung to and from the squeezing position with little effort. This machine, depicted in the illustration at the top of this column, also is equipped with vibrator, pressure gage and blow valve.

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Socket Screws—Holo-Krome Screw Corp., Bristol, Conn., is offering socket screws which have continuous, uncut fibers, neither severed nor broken, from one end of the screw to the other. The continuous fibers are said to give increased strength on all portions of the screw where strength is most needed. In combination with this development, the company features controlled grain size and atmospherically controlled electrical heat treatment.

♦ ♦ ♦

Flexible Aluminum Paint—Roxalin Flexible Lacquer Co., 800 Magnolia avenue, Elizabeth, N. J., has perfected flexible aluminum paint which gives a scale-like metal sheathing for longer protection, plus a smooth brilliant finish. Dirt and dust do not attach themselves readily to the surface of the paint. Because of water-resisting qualities (including salt water) the surface can be washed frequently without damage. The paint also displays resistance to chemical fumes, humid atmospheres, corrosion, rust and decay, and similar forces.

♦ ♦ ♦

Boiler Meter—Bailey Meter Co., 1050 Ivanhoe road, Cleveland, has developed a new steam flow-air flow boiler meter particularly well suited to industrial service. This device, shown herewith, records steam flow from the boiler, air flow supplied for combustion and flue gas temperature—all on one 12-inch diameter uniformly graduated chart. It also indicates steam flow on a porcelain enameled scale and integrates the total steam flow on a 6-digit counter which reads like an automobile mileage register.

The record of flue gas temperature which is given by this meter is at all times a dependable check on the condition of the boiler baffles and on the efficiency of the heat transfer through the boiler tubes. It shows whether or not the heating surface is absorbing the maximum amount of heat possible at all times.

Because of the present-day trend to the use of automatic combustion control in industrial boiler plants, the new boiler meter has been designed to fit into the Bailey meter control system. In this service, it automatically maintains maximum combustion efficiency by regulating air supply or stoker speed. In addition to maintaining combustion efficiency, the system for industrial applications, maintains steam pressure and furnace draft at the desired standard.

In operation, the new boiler meter is a simple and thoroughly reliable combustion guide which any boiler operator can easily understand. It is simply necessary for him to adjust the boiler damper or fuel control until the records of steam flow and air flow coincide, one upon the other, on the meter chart.

New Bailey boiler meter for industrial service

New Trade Publications

HEATING EQUIPMENT — National Radiator Corp., Johnstown, Pa., has published a folder illustrating and describing its steam heating furnaces, cast iron convectors and tube-type radiators.

SAND CONDITIONER—Jeffrey Mfg. Co., Columbus, O., in bulletin 603 announces its new portable sand conditioner for foundries, with illustrations showing its construction and operation.

PIG IRON — Uniformity secured through the mixing of iron in a large ladle before it is pigged is stressed in a recent folder by Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

PIG IRON—Chateaugay Ore & Iron Co., 26 Liberty street, New York, has published a booklet discussing the manufacture and the numerous advantages claimed for its low phosphorus pig iron.

COPPER-COVERED STEEL—H. H. Robertson Co., Pittsburgh, in a current folder describes its copper-covered sheet steel for long life and fine appearance. It is supplied in various forms for structural use.

STEEL ABRASIVES — Pittsburgh Crushed Steel Co., Pittsburgh, in a recent folder, outlines seven claims for its line of steel shot and angular steel grit for blast cleaning purposes. A chart shows the sizes of various numbers in both shot and grit.

INSULATING BRICK—A. P. Green Fire Brick Co., Mexico, Mo., in a current leaflet presents its G-25 controlled insulating fire brick, outlining its advantages and showing graphs of performance. Its use in heating furnaces is fully covered.

STRAIN GAGE—Bulletin No. 72 by the Baldwin-Southwark Corp., Southwark division, Philadelphia, covers the De Forest scratch recording strain gage by which permanent records of vibration are obtained. Interesting reproductions of tests are shown.

CENTRIFUGAL PUMPS—Worthington Pump & Machinery Corp., Harrison, N. J., has published a bulletin on its line of single-stage volute pumps. A sectional drawing shows the construction and lists the parts, while the text presents specifications.

UNIVERSAL MILLING MACHINE—Brown & Sharpe Mfg. Co., Providence, R. I., has issued a bulletin on its No. 2 universal milling machine, light type, including specifications, features of construction and description of attachments. It is well illustrated.

NUT TAPPING MACHINE—Acme Pattern & Machine Co., Buffalo, in a current bulletin describes its full automatic straight shank precision nut tapping machine. Illustrations show its operation and advantages of the straight shank are explained.

MOTORS—Allis-Chalmers Mfg. Co., Milwaukee, in leaflet No. 2182 describes its new seal-clad induction motor, with protected windings. They are built in ratings up to 25 horsepower, 1800 revolutions per minute, with ball or sleeve bearings.

WELDING RODS—Rich Mfg. Co., Ltd., 3851 Santa Fe avenue, Los Angeles, has issued a booklet on its welding rods and electrodes for strength and overlay welding. These cover rods and electrodes for all present forms of ferrous alloys and many nonferrous alloys.

PORTABLE CRANE—Canton Foundry & Machine Co., Canton, O., has issued a pocket booklet on its portable floor crane and hoist, with safety friction load brakes. A table of dimensions and prices is included. Illustrations suggest many uses for these devices.

STEEL—By-Product Steel Corp., division of Lukens Steel Co., Coatesville, Pa., sales office Broad Street Station building, Philadelphia, has issued a bulletin setting forth its supply of sheared plates, pressed shapes and steel blanks made to order.

PLATING—E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., has published an operating manual for plating with Duozinc, covering preparation of materials for plating, making up the solution, operation, analyzing the solution, testing the deposit and other details.

AIR COMPRESSORS—A line of air compressors for a wide variety of manufacturing plants is presented in a bulletin by the Curtis Pneumatic Machinery Co., St. Louis. Details of construction are presented and several other products, including hoists and cranes, are illustrated.

MALLEABLE CASTINGS—Lake City Malleable Co., Cleveland, presents in a current bulletin, the claims of its products, based on the performance of some of its castings that traveled 700,000 miles as part of a truck, and came through with a perfect score. Closeup views of the castings after their test are shown.

VALVES—Edward Valve & Mfg. Co., East Chicago, Ind., has issued its bulletin No. 11-G4, describing its forged steels specialties, including gage valves, straight-through valves, strainers, relief valves, special valves for turbine oil lines, oil well flow beans and small forged steel stop-check valves.

CONTROLLED EQUIPMENT—General Electric Co., Schenectady, N. Y., has issued a bulletin on controlled-atmosphere electric furnaces and auxiliaries. Continuous and intermittent furnaces for such uses as bright-annealing, scale-free hardening and normalizing, and electric furnace brazing are featured.

ELECTRIC MOTORS—Louis Allis Co., Milwaukee, has prepared a motor price wheel which lists frame sizes and list prices of 448 sizes of electric motors. The wheel consists of two fiber disks fastened at the center which may be rotated to bring to view the various specifications for each motor.

METAL GRILLES—Diamond Mfg. Co., Wyoming, Pa., has issued catalog No. 30, in looseleaf form, containing specifications for architects and engineers. Section 1 covers architectural grilles of heavy perforated metal and section 2 cast and wire grilles. Illustrations and tables of open areas are included.

METAL BALERS—Logemann Bros. Co., Milwaukee, in two current bulletins covers two types of metal balers. Bulletin No. 190 is devoted to triple-compression hydraulic metal balers, and No. 191 to ejecting-type balers. Both are illustrated to show details of construction and operation.

LADLES—New features of design in its line of geared ladles, including forced lubrication and automatic safety brake, are presented in bulletin No. 193 of the Whiting Corp., Harvey, Ill. The new ladle retains the cut helical-worm gearing and ball bearings provided in earlier designs.

DUST ARRESTERS—Whiting Corp., Harvey, Ill., in bulletin No. 194 describes its tube-type dust filters. Features of operation such as simplicity, standardized units, effective dust removal, ease of maintenance, etc., are discussed. A cutaway illustration shows construction of the unit and arrangement of the tube filters.

COLD-ROLLED STRIP STEEL — Blair Strip Steel Co., New Castle, Pa., has issued a booklet on cold-rolled strip steel refinement by Blair controlled processing. In it is described the various steps in production of cold-rolled strip from the original steel to the completed product. It is well illustrated and finely ornamented.

BAKELITE BONDED WHEELS—A booklet on high-speed abrasive wheels bonded with bakelite resinoid and designed for fast cutting, has been published by the Bakelite Corp., 247 Park avenue, New York. The text discusses and illustrates a number of applications for high-speed grinding wheels and stresses the special features of wheels bonded with bakelite.

SAFETY—Two publications by the Linde Air Products Co., New York, are devoted to safe practice in the use of its products. One contains recommended practices for gas cutting of structural steel and the other precautions and safe practices in the storage, care and handling of oxyacetylene welding and cutting equipment. They have come to be standard reference for safety and economy in the use of this class of equipment.

DIE CASTING—Madison-Kipp Corp., 20 Waubesa street, Madison, Wis., has issued two bulletins on its die-casting machines, No. DC-4040 is devoted to its models 4 and 5 automatic die-casting machines, with illustrations and detailed descriptions. The other publications are devoted to the "Kipcaster," a machine for the economical production of small parts by die casting. It is well illustrated.

SPECTOGRAPHS—Bausch & Lomb Optical Co., Rochester, N. Y., has published a booklet entitled "Something New In Spectographs" in which a small littrow spectograph is described. It is pointed out that this development provides an instrument for industry and education, where moderately high dispersion, but no great resolving power is necessary. The company also has published a bulletin on a new density comparator.

Pre-holiday Rush Sends Steel Rate to 37½

Releases Heavy, Makers Compensate for Respite This Week—Automotive Needs Expand—Raw Materials Active—Scrap Prices Leveling Off

PRESSURE for iron and steel is outweighing holiday influences, with the result steelworks operations last week continued strongly upward, advancing 4 points to 37½ per cent.

Comparatively little capacity will be taken off this week. For most producers Christmas and New Year will mean one-day holidays. They have already anticipated loss in production this week, to keep finished steel output abreast a vigorous demand from automobile, implement and tractor manufacturers.

This reversal of the customary year-end trend finds full-finished sheet output, mainly for automobile requirements, up to 48 per cent. In northern Ohio sheet mills reached a new high for the year—75 to 85 per cent. Operations in the tin plate industry, also running a contraseasonal course, are up 5 points to 50 per cent.

While the 34,000 automobiles made last week represented only a moderate gain, 10,000, over the preceding week, the industry is rapidly getting under way with new models. It sees no difficulty ahead in disposing of the first half million cars as rapidly as they can be turned out; hence manufacturers are accumulating material and parts, and establishing assembly lines for full production in January. Chevrolet's schedule is reported to call for 120,000 cars next month. Ford may be expected to equal or exceed this figure.

Farm Market Improves, Looks Better for 1935; Raw Materials Moving Faster

One of the market's chief supports is demand from agricultural implement manufacturers, who, having completed their best year since 1930, nevertheless are preparing for more substantial improvement. A better farm financial position has encouraged some leading makers to accumulate iron and steel stocks to carry them far into 1935. One shipment of 400 tractors has been made into the southern Indiana farm belt.

Steel buying undoubtedly has broadened to include many miscellaneous classifications long listless or dormant, but two of the dominant consumer groups—railroads and structural work—are lagging. The former's puchases in the week were negligible, it being an in-between season, while stuctural shape awards mounted moderately to 13,498 tons. For various navy yards 5000 tons of plates and sheets were awarded.

Scrap prices are strong, with some further increases at Chicago, but in general the market is quieter, suggesting that the upward movement which began in October is leveling off. On the other hand, pig iron sales continue to rise. Scrap and pig iron shipments this month will be substantially above November, an unusual occurrence.

Larger Importations Causing Some Concern; New Tin Plate Classifications

Mesabi iron ore producers have been denied by the Minnesota tax commission an 18 per cent reduction in their $200,000,000 tax assessment for 1934, notwithstanding a recent court ruling that valuations are too high. Imported chrome ore, of which 7000 tons were received at Philadelphia last week, is up 50 cents a ton. November iron and steel imports by this country were 35,272 tons, 75 per cent over October, and highest since March.

These larger importations have been causing domestic producers some concern. Recently 790 tons of steel piling was placed in Germany for one of the largest private projects in the eastern market.

Specifications for forging billets were driven by the new regulation becoming generally applicable putting billets under 4 x 4-inch on a steel bar base, raising the price of this material about $10 a ton. Also, by reports that new cutting extras are to be announced soon. Two new specific price classifications have been set up in tin plate, for so-called waste-waste, and tin plate strips, comprising assortments heretofore sold through individual negotiation.

Steelworks operations last week in the Cleveland district advanced 5 points to 64 per cent; Wheeling 10 to 80; Pittsburgh 2 to 26; Chicago 1 to 36½; eastern Pennsylvania 2½ to 22; Buffalo 13 to 37; New England 3 to 50; and Youngstown 5 to 44. Detroit hel dat 59 per cent, and Birmingham dropped 2½ points to 30 per cent.

STEEL's iron and steel price composite rose 2 cents to $32.46, due to gains in scrap. The scrap index itself was up 13 cents to $11.25. The finished steel composite remained $54.

COMPOSITE MARKET AVERAGES

	Dec. 22	Dec. 15	One Month Ago Nov., 1934	Three Months Ago Sept., 1934	One Year Ago Dec., 1933	Five Years Ago Dec., 1929
Iron and Steel Composite	$32.46	$32.44	$32.15	$32.15	$31.01	$35.43
Finished Steel Composite	54.00	54.00	54.00	54.00	51.10	56.33
Steelworks Scrap Composite	11.25	11.12	9.82	9.45	10.12	13.73

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip and cast iron pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Dec. 22, 1934	Nov. 1934	Sept. 1934	Dec. 1933
Finished Material				
Steel bars, Pittsburgh	1.80	1.80	1.80	1.75
Steel bars, Chicago	1.85	1.85	1.85	1.80
Steel bars, Philadelphia	2.09	2.09	2.09	2.04
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.60
Shapes, Pitsburgh	1.80	1.80	1.80	1.70
Shapes, Philadelphia	2.00½	2.00½	2.00½	1.90½
Shapes, Chicago	1.85	1.85	1.85	1.75
Tank plates, Pittsburgh	1.80	1.80	1.80	1.70
Tank plates, Philadelphia	1.98½	1.98½	1.98½	1.88½
Tank plates, Chicago	1.85	1.85	1.85	1.75
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	1.75
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.25
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	2.85
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	1.85
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.35
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	2.95
Plain wire, Pittsburgh	2.30	2.30	2.30	2.20
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.35
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$28.00	28.00	28.00	26.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	26.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	26.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00

	Dec. 22, 1934	Nov. 1934	Sept. 1934	Dec. 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.76	19.26
Basic, Valley	18.00	18.00	18.00	17.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	18.76
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.26	18.76
No. 2 foundry, Chicago	18.50	18.50	18.50	17.50
Southern No. 2, Birmingham	14.50	14.50	14.50	13.50
No. 2X eastern, del. Philadelphia	20.63	20.63	20.63	19.63
Malleable, Valley	18.50	18.50	18.50	17.50
Malleable, Chicago	18.50	18.50	18.50	17.50
Lake Superior charcoal, del. Chi.	24.04	24.04	24.04	23.54
Gray forge, del. Pittsburgh	18.63	18.63	18.88	18.38
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	87.24
Scrap				
Heavy melting steel, Pittsburgh	$13.25	11.15	10.75	12.20
Heavy melt. steel, No. 2, east. Pa.	9.50	8.35	8.00	8.25
Heavy melting steel, Chicago	10.75	9.10	8.65	9.00
Rails for rolling, Chicago	11.75	10.35	10.05	10.35
Railroad steel specialties, Chicago	12.25	10.05	9.80	10.50
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.60	3.75
Connellsville foundry, ovens	4.60	4.60	4.60	4.25
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.85c
Gary, base	1.95c
Chicago, del.	1.98c
New York, del.	2.18c
Philadelphia, del.	2.14c
Birmingham, base	2.00c
St. Louis, del.	2.17c
F.o.b. cars, dock, Pacific ports	2.40c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.40c
Gary, base	2.50c
Chicago, del.	2.53c
Detroit, del.	2.60c
New York, del.	2.73c
Philadelphia, del.	2.69c
Birmingham, base	2.55c
St. Louis, del.	2.72c
F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.10c
Gary, base	3.20c
Chicago, del.	3.23c
Philadelphia, del.	3.39c
New York, del.	3.43c
Birmingham, base	3.25c
St. Louis, del.	3.42c
San Francisco, f.o.b. cars, dock	3.70c

TIN MILL BLACK No. 28

Pittsburgh, base	2.75c
Gary, base	2.85c
St. Louis, del.	3.07c

COLD ROLLED No. 10

Pittsburgh, base	2.50c
Gary, base	2.60c
Detroit, delivered	2.70c
Philadelphia, del.	2.79c
New York, del.	2.83c
F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

Pittsburgh, base	2.95c
Gary, base	3.05c
Detroit, delivered	3.15c
Philadelphia, del.	3.24c
New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher.

Tin plate, coke base contract	$5.25
Do., stock	$4.90
Do., waste waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted	3.40c

Corrosion and Heat Resistant Alloys

Pittsburgh, base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold strip	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh, base	1.80c
New York, del.	2.08c
Philadelphia, del.	1.98½c
Boston, del.	2.20c
Buffalo, del.	2.03½c
Chicago or Gary base	1.85c
Cleveland, del.	1.98½c
Birmingham, base	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific Coast, f.o.b. cars, dock	2.35c
St. Louis, del.	2.07c

Structural Shapes

Pittsburgh, base	1.80c
Philadelphia, del.	2.00½c
New York, del	2.05¼c
Boston, del.	2.18½c
Bethlehem, base	1.90c
Chicago, base	1.85c
Cleveland, del.	1.98½c
Buffalo, base	1.90c
Gulf ports	2.20c
Birmingham, base	1.95c
Pacific Coast, f.o.b. cars, dock	2.35c

Bars

SOFT STEEL

Pittsburgh, base	1.80c
Chicago or Gary	1.85c
Duluth, base	1.95c
Birmingham, base	1.95c
Cleveland, base	1.85c
Buffalo	1.90c
Detroit, del.	1.95c
Pacific Coast ports cars, dock, c.i.f.	2.35c
Philadelphia, del.	2.09c
Boston, del.	2.20c
New York, del.	2.13c
Pitts., forg. qual.	1.95c-2.05c

RAIL STEEL
To Manufacturing Trade

Pittsburgh, base	1.70c
Chicago or Gary, base	1.75c
Moline, Ill., base	1.75c
Cleveland, base	1.75c
Buffalo, base	1.80c

IRON

Terre Haute, Ind.	1.75c
Chicago	1.80c
Philadelphia, base	1.89c
Pittsburgh, refined	2.75c-7.50c

REINFORCING

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo Cleve., Birm., Young	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
Philadelphia, del.	2.34c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young	1.95c
Gulf ports	2.30c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pitts.-Cleve. 100 lb. keg

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.10c
20,000 to 59,999 lbs.	2.05c
60,000 to 99,999 lbs.	2.00c
100,000 lbs. and over	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot) □

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo 0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni 1.05
5100 0.80-1.10 Cr 0.45
5100 Cr. spring base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon Van. 0.95
9250 Carbon base plus extras

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops □

Hot strip to 23⅛-in.

Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
Phila., delivered	2.14c
New York, del.	2.18c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$27.00
50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	$34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70-10-10 off
Rolled thread, ½ x 6 and smaller	70-10-10 off

MACHINE BOLTS

All sizes, cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts,	70-10-10 off
Tire bolts	60-10 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch	
Rolled thread machine bolts, ½ x 6 and smaller	70-10-10 off
Step bolts	70-10 off
Elevator bolts	70-10 off

NUTS

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-10 off
Do., ½ to 1-inch	70-10-10 off
Do., over 1-inch	70-10 off

HEXAGON CAP SCREWS

Milled	85 off
Upset, 1-in., smaller	85 off

SQUARE HEAD SET SCREWS

Upset, 1-in. small	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	2.90c
Struc., c. l., Chicago ⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila.	6.25 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

Steel

⅛, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$38.00-39.00
4-in., Birmingham	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago	46.00-47.00
6-in. & over, east fdy.	42.00
Do., 4-in.	45.00

Class A pipe $2 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
Philadelphia	32.30
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O., and Sparrows Point, Md.	28.00

SLABS

Pitts., Cleve., Young.	27.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville, fur.	$3.60- 3.85
Connellsville, fdry.	4.60
Connell. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	19.00c
90 per cent benzol	19.00c
Toluol	30 00c
Solvent naphtha	26.00c
Commercial xylol	26.00c

Per lb. f.o.b. New York

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

†Naphthalene flakes and balls, in bbl.	5.50c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25; 50-cent differentials apply to any grade below 1.75. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	18.50	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh district from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.00	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50
†Off grade material is $19.50

Philadelphia, standard and copper bearing 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½% Lower Lake Ports

Old range besemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos...	9.50
Spanish No. Africa basic, 50 to 60%....	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%.....	7.00
*Chrome ore, 48% gross ton, c.i.f.....	$18.00-18.50

Manganese Ore

(*Nominal*)

Prices, not including duty, cents per unit cargo lots.

Caucasian, 52-55%..	26.00
So. African, 52%.....	26.00
So. Afr., 49-51%.....	24.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories

Per 1000 f.o.b. Works

FIRE CLAY BRICK

First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago....	54.00
Birmingham, Ala.....	52.00

MAGNESITE

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases	40.00
Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash.	22.00

BASIC BRICK

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$19.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$15.50-16.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base...	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20% dom. fur. spot†....	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload..	85.00
Do., 75 per cent....	126-130.00

Spot, $5 a ton higher.

Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont.. on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton..	7.50
Ferrophosphorus, per ton, c. l., 17.-19% Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.50
Copper, hot rolled...	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base....	9.50
Tubes and Pipes	
High yellow brass..	17.00
Seamless copper.....	17.25
Rods	
High yellow brass..	13.00
Copper, hot rolled...	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	15.00

Old Metals

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.12½-4.37½
*Chicago	4.37½-4.62½
*Cleveland	5.00- 5.25
St. Louis	4.25- 4.50
Heavy Copper and Wire	
New York	5.50- 5.75
Chicago, No. 1	5.50- 5.75
Cleveland	5.00- 5.50
St. Louis	5.00- 5.25
Composition Brass Borings	
New York	3.75- 4.00
Light Copper	
New York	4.37½-4.62½
Chicago	4.25- 4.75
Cleveland	4.25- 4.75
St. Louis	4.25- 4.50
Light Brass	
*Chicago	2.25- 2.50
*Cleveland	2.50- 2.75
Lead	
*New York	2.75- 2.85
*Cleveland	2.75- 3.00
*Chicago	2.62½-2.87½
St. Louis	2.65- 2.75
Zinc	
New York	1.75- 2.00
Cleveland	1.75- 2.00
St. Louis	2.40- 2.50
Aluminum	
*Borings, Cleveland	7.50- 8.00
*Mixed, cast, Cleve.	11.50-12.00
Mixed, cast, St. L...	11.50-12.00
*Clips, soft, Cleve....	13.00-13.50

Secondary Metals

Brass ingot, 85-5-5-5	8.25
*Stand, No. 12 Alum.	16.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.00- 9.00
Boston, dock, expt.	8.00- 8.25
Boston, domestic	6.50- 6.75
Buffalo, No. 1	10.00 to 10.75
Buffalo, No. 2	8.75- 9.25
Chicago, No. 1	10.50-11.00
Cleveland, No. 1	10.00-10.50
Cleveland, No. 2	9.50-10.00
Detroit, No. 1	9.00- 9.50
Detroit, No. 2	8.00- 8.50
Eastern Pa.	11.00
Eastern Pa., No. 2	9.50
Federal Ill.	8.00- 8.50
Granite City, R. R.	9.00- 9.50
Granite City, No. 2	6.50- 7.00
N. Y., deal. No. 2	7.00
N. Y., deal. R. R.	8.50
Pittsburgh, No. 1	13.00-13.50
St. Louis	7.50- 8.00
Valleys, No. 1	12.50-13.00

COMPRESSED SHEETS

Buffalo, dealers	8.75- 9.25
Chicago, factory	9.25- 9.75
Cleveland	10.00-10.50
Detroit	9.25- 9.75
E. Pa., new mat.	9.50-10.00
Pittsburgh	13.00-13.50
St. Louis	7.00- 7.50
Valleys	12.00-12.50

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.50- 7.00
Cleveland	7.50- 8.00
Pittsburgh	11.25-11.75
St. Louis	5.00- 5.50

SHEET CLIPPINGS, LOOSE

Chicago	5.50- 6.00
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	11.00-11.50
Buffalo	12.00-12.75
Chicago (3 ft.)	12.50-13.00
Chicago (2 ft.)	13.50-14.00
Cincinnati, del.	11.50-12.00
Detroit	12.00-12.50
Pitts., open-hearth, 3 ft. and less	15.00-15.50
St. Louis, 2 ft. & less	11.50-12.00

STEEL RAILS, SCRAP

Boston	6.50- 6.75
Chicago	10.50-11.00
Pittsburgh	13.00-13.50

STOVE PLATE

Birmingham	5.50- 6.00
Boston, dealers	3.25- 3.75
Buffalo	8.75- 9.25
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	6.00- 6.50
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.50-13.00
Chicago, springs	12.00-12.50
Eastern Pa.	14.00-14.50
Pittsburgh	15.00-15.50
St. Louis	10.00-10.50

ANGLE BARS—STEEL

Chicago	11.50-12.00
St. Louis	9.50-10.00

RAILROAD SPECIALTIES

Chicago	12.00-12.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.50-13.00
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	15.00-15.50
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	10.50-11.00
St. Louis, cut	10.00-10.50

SHOVELING STEEL

Chicago	10.25-10.75
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.00- 6.50

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.00- 8.50
Buffalo, No. 2	10.00-10.75
Chicago, No. 1, net	10.00-10.50
Chicago, No. 2	10.50-11.00
Cincinnati, No. 2	8.50- 9.00
Eastern Pa.	11.50-12.00
N. Y., No. 1, deal.	7.00- 7.50
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	8.50- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.75- 9.25
Chicago, No. 1	9.50-10.00
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	3.50- 4.00
Cleveland, No. 2	7.00- 7.50
Detroit, No. 1, new	8.00- 8.50
Valleys, new, No. 1	12.00-12.50

MACHINE TURNINGS

Birmingham	4.50- 5.00
Boston, dealers	1.75- 2.00
Buffalo	4.75- 5.25
Chicago	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	7.00- 7.50
Detroit	5.00- 5.50
Eastern Pa.	6.00- 6.50
New York, dealers	2.00- 2.25
Pittsburgh	8.75- 9.25
St. Louis	3.00- 3.50
Valleys	9.25- 9.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Cincinnati, dealers	4.00- 4.50
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.25- 6.75

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	5.50- 6.00
Chicago	6.25- 6.75
Cincinnati, dealers	4.00- 4.50
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
E. Pa., chemical	12.00-13.00
New York, dealers	1.50- 1.75
Pittsburgh	6.25- 6.75
St. Louis	3.00- 3.50

PIPE AND FLUES

Cincinnati, dealers	4.50- 5.00

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	5.75- 6.25
Cincinnati	4.50- 5.00
Eastern Pa.	8.50- 9.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	5.00- 5.50
Buffalo	8.75- 9.25
Cleveland	8.50- 9.00
Detroit	7.50- 8.00

FORGE SCRAP

Boston, dealers	5.00- 5.25
Chicago, heavy	11.50-12.00
Eastern Pa.	9.00- 9.50

ARCH BARS, TRANSOMS

St. Louis	11.50-12.00

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.00- 7.50
Chicago, elec. fur.	10.00-10.50
Cleveland	7.00- 7.50
Eastern Pa.	9.50-10.00
St. Louis	6.50- 7.00

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point.	10.00-10.50
Buffalo	12.50-13.00
Chicago, net	15.50-16.00
Eastern Pa.	16.50-17.00
St. Louis	12.25-12.75

SHAFTING

Boston, ship. point.	11.75-12.00
Eastern Pa.	16.50-17.00
New York, dealers	10.75-11.25
St. Louis	11.50-12.00

CAR WHEELS

Birmingham, iron	8.50- 9.50
Boston, iron deal.	5.50- 6.00
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	11.50-12.00
Chicago, rolled steel	12.50-13.00
Cincinnati, iron	8.50- 9.00
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	14.00-14.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	15.00-15.50
St. Louis, iron	7.50- 8.00
St. Louis, steel	9.50-10.00

NO. 1 CAST SCRAP

Birmingham	9.00- 9.50
Boston, No. 2	6.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	9.50-10.00
Buffalo, mach.	11.00-11.50
Chicago, agri. net	8.50- 9.00
Chicago, mach. net	10.00-10.50
Chicago, railroad net	9.00- 9.50
Cinci., mach. cup.	9.50-10.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-11.50
Pittsburgh, cupola	13.50-14.00
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.50- 9.00
St. L., No. 1 mach.	10.25-10.75

HEAVY CAST

Boston, del.	5.25- 5.50
Buffalo, break.	8.00- 8.50
Cleveland, break.	8.50- 9.00
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.00
N. Y., break. deal.	6.00- 6.25
Pittsburgh	12.00-12.50

MALLEABLE

Boston, consum.	10.00-10.50
Buffalo	10.50-11.00
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del	8.00- 8.50
Cleveland, rail	11.50-12.00
Detroit, auto	10.00-10.50
St. Louis, R. R.	10.00-10.50
Eastern Pa., R. R.	10.50-11.00

RAILS FOR ROLLING

5 feet and over

Birmingham	9.50-10.50
Boston, dealers	8.00- 8.50
Buffalo	10.25-10.75
Chicago	11.50-12.00
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	10.00-10.50

LOW PHOS. PUNCHINGS

Buffalo	12.50-13.00
Chicago	12.50-13.00
Eastern Pa.	14.50-15.00
Pittsburgh	14.00-14.50

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper			Straits Tin			Lead		Zinc	Aluminum		Nickel
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	Lead N. Y.	East St. L.	Zinc St. L.	99%	Antimony Spot, N. Y.	Cathodes
Dec. 15	9.00	9.12½	7.37½	50.92½	50.95	3.60	3.45	3.70	*19.00	13.75	35.00
Dec. 17	9.00	9.12½	7.37½	50.85	50.85	3.70	3.55	3.70	*19.00	13.75	35.00
Dec. 18	9.00	9.12½	7.25	50.92½	50.95	3.70	3.55	3.75	*19.00	13.75	35.00
Dec. 19	9.00	9.12½	7.50	50.87½	50.90	3.70	3.55	3.72½	*19.00	13.75	35.00
Dec. 20	9.00	9.12½	7.50	50.80	50.82½	3.70	3.55	3.72½	*19.00	13.75	35.00
Dec. 21	9.00	9.12½	7.50	50.75	50.77½	3.70	3.55	3.72½	*19.00	13.75	35.00

*Nominal range 19.00c to 21.00c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	□
Baltimore*	2.90c
Boston††	2.95c
Buffalo	3.00c
Chattanooga	3.31c
Chicago	2.95c
Cincinnati	3.15c
Cleveland	2.95c
Detroit	3.03½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.30c
New York‡(d)	3.22c
Pittsburgh(h)	2.90c
Philadelphia*	2.90c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.19c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Portland	3.40c
Chattanooga	3.31c
Baltimore*	3.00c
Chicago	2.75c
Cincinnati	3.15c
New York‡(d)	3.32c
Philadelphia*	2.90c
St. Louis	3.19c
Tulsa	3.25c

REINFORC. BARS	□
Buffalo	2.60c
Chattanooga	3.31c
Chicago	2.10c-2.60c
Cleveland(c)	1.97½c
Cincinnati	3.25c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.24c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore*	3.90c
Boston††	3.17c
Buffalo	3.25c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland	3.31c
Detroit	3.40c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.37c
Philadelphia*	2.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore*	2.90c
Boston††	3.18c
Buffalo	3.37c
Chattanooga	3.56c
Chicago	3.20c
Cincinnati	3.40c
Cleveland, ¼-in. and over	3.31c
Detroit	3.40c
Detroit, ⅜-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.55c
New York(d)	3.40c
Philadelphia*	2.95c
Phila. floor	4.95c
Pittsburgh(h)	3.15c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.44c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore*	3.05c
Boston††	3.25c
Buffalo	3.62c
Chattanooga	3.36c
Chicago	3.00c
Cincinnati	3.20c
Cleveland	3.11c
Det., 8-10 ga.	3.13½c
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.55c
New York	3.27c
Portland	3.75c
Philadelphia*	3.05c
Pittsburgh(h)	2.95c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.29c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Baltimore*†	3.51c
Boston (g)	3.90c
Buffalo	3.25c
Chattanooga	4.21c
Chicago	3.85c
Cincinnati	4.05c
Cleveland	3.91c
Detroit	3.98½c
Los Angeles	4.45c
New York	3.85c
Philadelphia*†	3.55c
Pitts.** (h)	3.55c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.09c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Baltimore*†	4.21c
Buffalo	4.00c
Boston (g)	4.60c
Chattanooga	4.86c
Chicago (h)	4.55c
Cincinnati	4.70c
Cleveland	4.61c
Detroit	4.70c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.50c
Philadelphia*†	4.25c
Pitts.** (h)	4.15-4.45c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.79c
St. Paul	4.19c
Tulsa	5.10c

BANDS	□
Baltimore*	3.15c
Boston††	3.25c
Buffalo	3.42c
Chattanooga	3.61c
Chicago	3.30c
Cincinnati	3.45c
Cleveland	3.36c
Detroit, ⅜-in. and lighter	3.38½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.59c
New York(d)	3.62c
Philadelphia	3.15c
Pittsburgh(h)	3.20c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Louis	3.54c
St. Paul	3.20c
Tulsa	3.45c

HOOPS	
Baltimore	2.30c
Boston	4.25c
Buffalo	3.42c
Chicago	3.30c
Cincinnati	3.45c
Det., No. 14 and lighter	3.38½c
New York	3.62c
Philadelphia	3.40c
Pittsburgh(h)	3.70c
Seattle	5.60c
St. Louis	3.54c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	4.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f) (d)	4.75c
St. Louis	3.74c
St. Paul	3.20c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	3.39c
Chicago	3.27c
Cincinnati(b)	3.42c
Cleveland (b)	3.20c
Detroit	3.33c
New York	4.70c
St. Louis	3.36c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 20

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons	
PIG IRON	£ s d		Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.19	3 1 6	$13.64	1 14 0
Basic bessemer	13.59	2 15 0*	12.83	1 12 0
Hematite, Phos. .03-.05	15.44	3 2 6	.....	.....
SEMIFINISHED STEEL				
Billets	$27.17	5 10 0	$18.85	2 7 0
Wire rods, No. 5 gage	38.53	7 16 0	36.08	4 10 0
FINISHED STEEL				
Standard rails	$38.29	7 15 0	$44.10	5 10 0
Merchant bars	1.66c	7 10 0	1.15c to 1.19c	3 2 6 to 3 5 0
Structural shapes	1.63c	7 7 6	1.12c	3 1 6
Plates, †¼ in. or 5 mm.	1.77c	8 0 0	1.50c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.04c	9 5 0	2.11c	5 16 0
Sheets, gal., 24 gage, corr.	2.49c	11 5 0	2.36c	6 10 0
Bands and strips	1.88c	8 10 0	1.45c	4 0 0
Plain wire, base	2.04c	9 5 0	1.94c	5 7 6
Galvanized wire, base	2.49c	11 5 0	2.27c to 2.32c	6 5 6 to 6 7 6
Wire nails, base	2.65c	12 0 0	2.09c	5 15 0
Tin plate, box 108 lbs.	$ 4.45	0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$16.67	3 7 6(a)	$13.86	210	$14.51	310	$25.34	63
Basic bessemer pig iron	16.67	3 7 6(a)*	12.21	185	12.64	270	27.96 (b)	69.50
Furnace coke	4.32	0 17 6	7.92	120	5.15	110	7.64	19
Billets	27.17	5 10 0	28.38	430	20.59	440	38.82	96.50
Standard rails	1.82c	8 5 0	2.08c	694	2.31c	1,100	2.40c	132
Merchant bars	1.90c	8 12 0	1.68c	560	1.16c	550	2.00c	110
Structural shapes	1.93c	8 15 0	1.65c	550	1.16c	550	1.96c	107.50
Plates, †¼-in. or 5 mm.	2.00c	9 1 3	2.10c	700	1.47c	700	2.31c	127
Sheets, black	2.32c	10 10 0§	2.55c	850‡	1.63c	775‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.87c	13 0 0	4.50c	1,500	3.15c	1,500	6.73c	370
Plain wire	2.04c	9 5 0	3.15c	1,050	2.31c	1,100	3.15c	173
Bands and strips	2.07c	9 7 0	1.95c	650	1.47c	700	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. 24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite.
**Gold pound sterling carries a premium of 64.75 per cent over paper sterling.

Bars

Bar Prices, Page 46

Pittsburgh—Many alloy and carbon bar buyers last week entered specifications for tonnage to be shipped after Jan. 1. There also was a fair volume of bar demand for immediate shipment. Activity of some farm implement manufacturers still is strong. One leading mid-western tractor maker recently shipped almost 400 tractors in a single lot to southern Indiana dealers. The same maker, which has been prominently buying both hot and cold drawn bars, also shipped four solid trainloads of farm equipment recently. The automobile industry is also buying merchant bars in good volume. Merchant bar mills in the Pittsburgh district are operating at over 30 per cent of capacity. Base prices remain quoted 1.80c, for hot-rolled carbon bars, and 2.45c, base, for alloy quality.

Cleveland — Specifications from automobile manufacturers have increased in number, reflecting increased production in that industry. The Cleveland bar mill is operating slightly above 50 per cent. Nearly all orders are for immediate shipment. Agricultural implement manufacturers and tractor builders are preparing for larger sales in 1935, and are buying more material. Forging quality billets under 4 x 4-inch now are being sold on a steel bar base, raising the price about $10 a ton for those who have been using these billets instead of bars.

Chicago—Steel bar sales and specifications recently have been in the best volume in nearly six months, more active than other heavy rolled products. While automotive orders continue to lead and show further improvement, substantial business is appearing from farm implement manufacturers and miscellaneous consumers. Business from implement makers also has tended upward moderately and prospects for further gains are favorable. Forward buying still is limited in most directions.

Boston—Commercial steel and alloy bars are less active and generally in small lots. Some consumers have covered for first quarter. Bars hold at 2.20c, Boston.

New York—Following fair improvement during the first three weeks of December demand for steel bars has succumbed to holiday influences. Some first-quarter inquiry from railroads is before the trade.

New York—Pennsylvania Forge Corp., Philadelphia, is low on steel forgings for shafting, for four destroyers building at the Boston and Philadelphia navy yards at $92,803.62; also for four destroyers being built at Mare Island and Puget Sound, bidding $64,191.28, delivered, or $62,174.80, f.o.b. works.

Philadelphia—Following improvement in specifications last week, commercial steel bar tonnage has declined under holiday influences. While the volume specified so far this month has been far from active, the general trend over the past several weeks has been slightly upward. The market is steady at 2.09c, Philadelphia.

Washington—Bids will be taken Jan. 4 by the bureau of supplies and accounts, navy department, for 417,880 pounds of steel forgings for shafting.

The bureau of supplies and accounts, navy department, has awarded bars for cruisers now building at several navy yards as follows: Superior Steel Corp., Pittsburgh, 138 tons; Bethlehem Steel Co., Bethlehem, Pa., 225 tons, Carnegie Steel Co., Pittsburgh, 108 tons, and Penn Galvanizing Co., Philadelphia, 138 tons.

Plates

Plate Prices, Page 46

Pittsburgh — Approximately 1000 tons of ½-inch plate probably will be fabricated by McClintic-Marshall Corp., Bethlehem, Pa., for 6120 feet of 28-inch diameter land pipe for the Fort Peck dam dredges. This pipe is in 480 12-foot 10-inch lengths and McClintic-Marshall was low at $39,062.35 on recent bids. The total bid includes 1000 pipe connecting links, the same company also low at $10,499.76. Dravo Contracting Co., last week was awarded contract to construct two steel service flats on a low bid of $9960 for the Huntington, W. Va., army engineers. At its Leetsdale shops near Pittsburgh, McClintic-Marshall Corp. last week had begun to lay bottom plates on a fleet of eight standard coal barges for the Campbell Transportation Co., Pittsburgh.

Chicago — Plate business is coming principally from miscellaneous sources and for public projects. Orders for railroad equipment have consisted largely of tonnage for the 1200 freight cars for the National railways of Mexico, to be built in this district. Tank work is quiet but several substantial lots have been placed and are in prospect for Mississippi river dams.

Cleveland—Plate sellers here report the week's tonnage was the best in several months, with orders still limited to 100 tons or less. The improvement was noted especially in demand from tank builders and boiler shops. Inquiry has broadened. The Cleveland plate mill operated at 25 per cent. The proposed mill quantity differentials on plates and shapes again have been suspended until March 1, for shipments after April 1.

Boston — Releases on several thousand tons of plates for the Boston and Portsmouth, N. H., navy yards, recently awarded several mills have not started. Meanwhile, plate demand is light, mainly miscellaneous requirements in small spot lots. Prices are unchanged at 2.20c, Boston.

New York—Demand for steel plates exceeds that of November despite the spot character of buying. No large tonnages are in the market at present.

Philadelphia — District plants share substantially in the recent distribution of tonnage by the navy department. One eastern Pennsylvania mill booked approximately 2500 tons under three schedules with the largest single lot ranging between 1125 and 1500 tons. Within the past few days bids have also been opened on the construction of the Erie ferryboat, involving 600 tons of steel. The Bethlehem Shipbuilding Corp. Ltd., Bethlehem, Pa., is reported low on two Pennsylvania railroad barges requiring 520 tons of plates and shapes. Only one barge may be awarded at present.

Distribution also is pending on 425 tons of high tensile black plates for the Philadelphia navy yard, for the U. S. S. Wichita. Railroad tonnage is featured by the placing of approximately 400 tons of car repair work by the Reading Co., with three district mills. The market continues 1.90c, Coatesville, Pa., or 1.98½c, Philadelphia.

San Francisco—Slackness in plate buying is noted and awards did not exceed 600 tons. Western Pipe & Steel Co., San Francisco, took 295 tons of 30-inch pipe for the University Mound pipe line, San Francisco. New bids will be opened Jan. 7, for close to 4000 tons for the second unit of the metropolitan water district aqueduct, Los Angeles.

Seattle—Jobbers report fair demand for heavy plates for the Coulee Washington dam, and ship repair work. Powerhouse mechanical equipment and boilers for Washington state college, Pullman, bids Dec. 28, involve an unstated tonnage of plates and shapes. A. N. Eaton Metal Products Co., Helena, Mont., has the award for furnishing Montana highway department a supply of cylin-

drical gasoline tanks and portable metal oil houses.

Contracts Placed

2288 tons, with allowance for 50 per cent additional tonnage, for navy work at the Brooklyn navy yard, schedule 3814, distribution as follows: Black plates and sheets, 1125 tons to Lukens Steel Co., Coatesville, Pa.; 250 tons, Jones & Laughlin Steel Corp., Pittsburgh; 200 tons, Joseph T. Ryerson & Sons Inc., Chicago; 150 tons, Bethlehem Steel Co., Bethlehem, Pa.; and 25 tons to the Alan Wood Steel Co., Conshohocken, Pa.; galvanized plates and sheets, 300 tons, Ross Galvanizing Works, Brooklyn, N. Y.; 100 tons, Central Iron & Steel Co., Harrisburg, Pa.; 88 tons, Worth Steel Co., Claymont, Del., and 50 tons, Carnegie Steel Co., Pittsburgh.

2406 tons, bureau of supplies and accounts, navy department, submarines, including delivery, Portsmouth, N. H., and Mare Island, Calif., awarded as follows: Carnegie Steel Co., Pittsburgh, 760; Alan Wood Steel Co., Philadelphia, 199; Lukens Steel Co., Coatesville, Pa., 570; Bethlehem Steel Co., Bethlehem, Pa., 217; Jones & Laughlin Steel Corp., Pittsburgh, 483; Central Iron & Steel Co., Harrisburg, Pa., 132; Penn Galvanizing Co., Philadelphia, 20; American Rolling Mill Co., Middletown, O., 20, and American Sheet & Tin Plate Co., Pittsburgh, 15.

659 tons, boiler plates, destroyers, bureau of supplies and accounts, navy department, delivery at Boston, Norfolk, Va., Mare Island, Calif., and Puget Sound, Wash., to Central Iron & Steel Co., Harrisburg, Pa., 329 tons, and Youngstown Sheet & Tube Co., Youngstown, O., 330 tons.

400 tons, car repairs, Reading Co., Philadelphia, placed, with Lukens Steel Co., Coatesville, Pa., Bethlehem Steel Co., Bethlehem, Pa., and Alan Wood Steel Co., Conshohocken, Pa., said to have participated.

295 tons, University Mound pipe line, Hetch Hetchy project, San Francisco, to Western Pipe & Steel Co., San Francisco.

110 tons, elevated storage tank, Union City, Ind., to Western Gas Construction Co., Fort Wayne, Ind.

Contracts Pending

1000 tons, 480 lengths of 28-inch diameter land pipe of ½-inch plates for delivery to Wiota, Mont., for Fort Peck dam dredges, including 1000 28-inch land pipe connecting links; McClintic-Marshall Corp., Bethlehem, Pa., low at $39,062.35 on bids opened Dec. 12; Taylor Forge & Pipe Works, Chicago, second low at 542,778.25; Alco Products Co., New York, third low at $47,200; Omaha Steel Works, Omaha, Nebr., submitted only a partial bid.

435 tons, two coal barges, Pennsylvania railroad, Philadelphia, bids opened on construction, Dec. 19; 85 tons of shapes also required.

Unstated, boiler and power house mechanical equipment, Washington State college, Pullman; bids Dec. 28.

Unstated, but relatively small tonnage for the airplane carrier RANGER under construction in the Norfolk, Va., navy yard; bids opened.

Transportation

Track Material Prices, Page 47

Railmakers are hopeful of considerable tonnage of rail buying early in the year, orders being expected from the Chesapeake & Ohio, Erie and Nickel Plate in the East and the Chicago, Burlington & Quincy in the West. The Pennsylvania has somewhat more than normal stock of unlaid rails but probably will have to buy further.

General American Tank Car Corp., Chicago, will build 400 of the 1200 freight cars recently placed by the National Railways of Mexico with the Pullman Car & Mfg. Corp., Chicago, which will fabricate the remaining 800.

Illinois Central has ordered four sets of thermal gravity air conditioning systems from the American Car & Foundry Co., New York. Great Northern is to air condition all the passenger equipment of the Empire Builder, one of its through trains, a total of 43 Pullman cars.

Chespeake & Ohio is in the market for ten light-weight steel hoppers. New York Central and Lehigh Valley are inquiring for first quarter miscellaneous requirements of steel, the former to have a Clayton act opening Dec. 28.

Sheets

Sheet Prices, Page 46

Pittsburgh—A sharp advance in full-finished sheet production to 48 per cent through last week was caused by several producers grouping specifications for both last week and part of this week, due to Christmas. The improvement was not entirely shared throughout the sheet market as the average of galvanized sheet operations declined to 39 per cent, the lowest since October, although black sheet production for the industry was up to a range around 42 per cent. A very heavy demand for common black barrel stock is noted. Aside from the heavier call for full-finished sheets from the automobile industry, farm implement makers also are more active in the market. Sellers continue to quote firmly on the basis of 2.40c, for black sheets; 3.10c for galvanized, and both 2.50c and 2.95c for the full-finished grades, all Pittsburgh bases.

Cleveland—Sheet mill operations in this district last week were up 25 points to 75 to 85 per cent, on specifications from automobile manufacturers and partsmakers. The number of orders increased considerably, virtually all leading consumers in the industry figuring in the buying movement, though individual tonnages were not up to expectations. Preparations having been completed, assemblies started, and manufacturers now want material promptly. Chevrolet is understood to have scheduled 120,000 cars for January. The industry does not expect any difficulty in marketing the first half million cars as rapidly as they can be produced. In other directions, orders are coming chiefly from manufacturers of refrigerators, also getting into production on new models.

Chicago—Sheet demand still is tending upward among both automotive interests and miscellaneous consumers. Consumption by the former group is expanding more rapidly and requirements are substantially heavier than a year ago. Mills anticipate further gains over coming weeks, while the outlook for increased consumption among other important customers is seen as favorable. Most buying is for early needs, however, except in the case of the automotive industry.

Boston—Demand for sheets has sagged, most buyers having stock on hand for a few weeks. Inventories are low, indicating early improvement. Small tank and container demand has dropped. A fair call is noted for shelving.

New York—Sheet buying for the month will show a good gain over November, with demand more diversified. New York state will open bids Dec. 27 on automobile license tags, with 750 tons required for first quarter and 450 tons for second quarter. The material is to be No. 24 gage, with alternate bids on cold-rolled and singled pickled. One thousand tons are to be 13⅝ x 71 inches, and 200 tons 16 x 68 inches.

Philadelphia—Until the past few days, when affected by holiday influences, sheet tonnage placed in this district exceeded that for the corresponding period of November. Due to substantial purchases by an autobody manufacturer here it is believed that the showing for the month as a whole will prove better than November. Maryland has opened bids on more than 300 tons of sheets for 1936 automobile license plates. Pennsylvania opened bids Dec. 19 on 57 tons of sheets for road signs. Prices are steady.

Buffalo—Sheet production, which was holding at about 15 per cent mark has been increased to 25 per cent. This rate will continue after a three-day shutdown for

Christmas holidays with prospect of further increases in output shortly after Jan. 1.

Cincinnati — Sheet production continued near 60 per cent. Miscellaneous demand has been steady, while automotive requirements have increased. Some mills announced they would be down Monday as well as Tuesday.

Birmingham, Ala.—Sheet mills, which have been operating steadily for many months, have suspended for the Christmas holidays.

Pipe

Pipe Prices, Page 47

Pittsburgh—Well-distributed orders for oil country goods continued last week, in addition to awards of standard pipe, comparable in size with November. Pipe interests show distinct encouragement over the present sustainment of orders, at a time when demand would be expected to fall off. In boiler tubes there is prospect of considerable railroad and marine repair business, and mechanical tubing has already received impetus from the automotive industry. No change in pipe discounts occurs with the first quarter.

Chicago—Cast pipe demand continues slow but sellers are optimistic over eventual placing of much business originally proposed for closing this year. While 1934 has proved to be little if any better than 1933, a rather large volume of potential business has accumulated.

Boston—Cast pipe inquiry and buying is light. Standard steel pipe which has been moving fairly well, also has slumped. However, a number of heating contracts call for fair lots of steel pipe. Utilities, having bought a minimum of pipe during the year, are not expected to increase purchases materially during the first quarter.

New York—While awards are heavier, due to placing of requirements for Watervliet and White Plains, N. Y., inquiry for cast pipe is light and small-lot volume has slumped. On 10,000 feet, 24-inch, for Watervliet, the low bid was $3.76 per foot, delivered.

Birmingham, Ala.—Pipe shops anticipate an active demand in January.

San Francisco—The only cast iron pipe award of size went to the United States Pipe & Foundry Co., and called for 126 tons for Porterville, Calif. Bids were opened this week on a number of new inquiries which aggregated over 1300 tons. Most important among these were 403 tons for Parawan and 250 tons for Gunnison, Utah. Bids also have been taken on 600 tons for a 28-inch steel pipe line for the Fort Peck dam, Montana.

Seattle—Bids for furnishing miscellaneous pipe and accessories for Fort Peck, Mont., were opened by army engineers this week. Yakima, Wash., has opened bids for a small tonnage of cast iron pipe. Seattle will open bids Dec. 27 for flow measuring equipment. Butte Falls, Jackson county, Oreg., is considering figures submitted for 6000 feet of 4 and 6-inch cast iron pipe, alternate wood.

Cast Pipe Placed

1100 tons, 24-inch, Watervliet, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.; Solomon & Keis, Troy, N. Y., engineers for project.

700 tons, various sizes, White Plains, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J., contractor's

HOCKEY, the fastest game in the world of sports, thrills the fans with its colorful action. Its split-second plays, as the skaters drive the elusive puck over the gleaming ice, make most other sports look like "slow motion."

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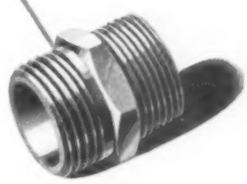

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award.
126 tons, 4 to 10-inch, class 150, Porterville, Calif., to United States Pipe & Foundry Co., Burlington, N. J.
100 tons, 6-inch, Chicago, to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

Cast Pipe Pending

785 tons, 6-inch and under, natural gas line, Canton, Miss.; bids Dec. 28, Black & Veatch, Kansas City, Mo., consulting engineers.
460 tons, 6 to 18-inch, La Porte, Ind.
403 tons, 2 to 8-inch, class 150, Parawan, Utah; bids in.
250 tons 8-inch class 150, Gunnison, Utah; bids in.
247 tons, 6-inch, class 150, Centerfield, Utah; bids in.
215 tons, 8-inch and under, Richmond, Tex.; bids Dec. 28.
210 tons, 2 to 8-inch, class 150, Hot Springs, Mont.; bids in.
201 tons, 3-inch, class 150, Wellington, Utah; bids in.
125 tons, 12-inch and under, Salisbury, Md.; bids Dec. 27.

Steel Pipe Pending

675 tons, 6-inch, natural gas line, Canton, Miss.; bids Dec. 28, Black & Veatch, Kansas City, Mo., consulting engineers.
600 tons, 28-inch, Fort Peck dam, Wiota, Mont.; bids in.
250 tons, caissons, bridge, Hampton boulevard, Norfolk, Va.; bids Jan. 15, Walter H. Taylor, director of public works, Norfolk.

Shapes

Structural Shape Prices, Page 46

Pittsburgh—Inquiry for a 164-ton railroad overhead bridge in Chester county, Pennsylvania, was issued last week by the state department of highways, bids Jan. 4. F. E. Trimpey & Sons, Casselman, Pa., are low on a 119-ton Armstrong county bridge, and Sheesley & Janney Construction Co., Johnstown, Pa., low on the 101-ton Westmoreland county bridge.

Cleveland—New bids are being taken by the Lowensohn Construction Co., Cleveland, on 3000 tons of structural shapes for the Lorain road, Cuyahoga county (Cleveland) bridge over Rocky river. This company was awarded the general contract several weeks ago on a bid of approximately 5½ cents per pound for fabricating and erecting, not including cost of dismantling the present structure. Purchases of small lots of structural shape have improved moderately.

Chicago—Mississippi river dam work continues to head structural inquiries and awards. For the Muscatine, Iowa, unit, 2800 tons of piling and 2500 tons of structural material have been placed. Bids are in on 2750 tons of shapes and piling for the Winona, Minn., dam, while bids close Jan. 9 on 5100 tons for the Guttenberg, Iowa, dam. Low bidders have been announced on the 1500-ton bridge at Ottumwa, Iowa, although bids also were taken on a concrete alternate design which, if accepted, would require only 600 tons of shapes. Miscellaneous bridge inquiries involve about 3400 tons.

Boston—Bids are in on bridges at Holyoke and Medford, Mass., requiring several hundred tons. Awards are light. The war department will spend $986,000 for repairs at the Boston army supply base, mainly for repairs to piers and wharves.

New York—Bids closed last week on 2300 tons for bridge requirements for New York and New Jersey, the largest being in Broome county, New York, awarded to the American Bridge Co., Pittsburgh.

Bookings of fabricated structural steel recovered markedly during November, according to the American Institute of Steel Construction. Reports indicate that the volume was 30 per cent larger for October, 10 per cent larger than the average for the third quarter, and 12 per cent larger than for November, 1933.

Philadelphia—Placing of 475 tons for two structural jobs with two local fabricators is outstanding in the structural market here. One project involves 375 tons for the Blue Ridge Co. factory building at Glasgow, Va., and the other 100 tons for a factory building for the Tannen Corp., Wilmington, Del. Plant additions for the Celanese Corp., Cumberland, Md., will require 630 tons, with the Hughes, Foulkrod Co., this city, awarded the general contract on one section involving 200 tons. Approximately 2000 tons of small angles and tubing will be required for 87,500 cots on which bids will be opened Jan. 7, by the local offices of the quartermaster's division of the war department.

San Francisco—Fabricating shops have small backlogs, and little new business developed during the past week. Bids have been opened on over 7500 tons, including 3000 tons of piling, for a bulkhead at Oakland, Calif., and 1850 tons for the metropolitan water district, Los Angeles. On segregated bids for 2300 tons for the Hall of Records, Oakland, Calif., Pacific Coast Steel Corp., San Francisco, was low bidder, although Columbia Steel Corp., San Francisco, is the low subcontractor for the steel under the low general contract bid submitted by MacDonald & Kahn, Oakland, Calif.

Seattle—Only minor tonnages were awarded during the week. District engineer, Portland, Oreg., will receive bids Dec. 28 for a swing span, 266 feet long, estimated at $55,000, for navigation locks at the Bonneville, Oreg., dam. Tonnage is unstated. Business pending includes 100 tons for the Nizina river bridge, Alaska, for which bids were opened Dec. 5.

Shape Awards Compared

	Tons
Week ended Dec. 22	13,498
Week ended Dec. 15	9,408
Week ended Dec. 8	5,551
This week in 1933	18,065
Weekly average, 1933	9,296
Weekly average, 1934	16,443
Weekly average, November	22,332
Total to date, 1933	788,076
Total to date, 1934	855,223

Shape Contracts Placed

5300 tons, shapes and piling, Mississippi river dam, Muscatine, Iowa; 2800 tons, piling to Inland Steel Co., Chicago, 2500 tons, shapes, to R. C. Mahon Co., Detroit. Central Engineering Co., Davenport, Iowa, general contractor.
1400 tons, state highway bridge, Broome county, New York, to American Bridge Co., Pittsburgh; through M. R. Ingraham Inc.
1175 tons, viaduct, Norfolk & Western railroad, Lambert Point, Va., to Virginia Bridge & Iron Co., Roanoke, Va.
1100 tons, bridge, Pawnee-Osage counties, Oklahoma, to McClintic-Marshall Corp., Bethlehem, Pa.
385 tons, penstock, trashrack, Wheeler dam, Tennessee valley authority, to Bartlett-Hayward Co., Baltimore.
375 tons, or more, textile plant buildings, Blueridge Co. Inc., Glasgow, Va., to Belmont Iron Works, Philadelphia. Reinforcing bars to Concrete Steel Co., New York; John P. Pettyjohn & Co., Lynchburg, Va., general contractor.
350 tons, bridge, Clay Center, Kans., to St. Joseph Structural Steel Co., St. Joseph, Mo.
350 tons, intake tower material, Boulder City, Nev., for bureau of reclamation to McClintic-Marshall Corp., Bethlehem, Pa.
340 tons, four bridge spans, intake towers, Boulder dam, Boulder City, Nev., to unnamed interest.
285 tons, school, East Rockaway, N. Y., to Bethlehem Fabricators Inc., Bethlehem, Pa.; through Jonwal Construction Co.
270 tons, alterations, Herald-Tribune building, New York, to George A. Just Co., Long Island City, N. Y.
215 tons, state highway bridge, Bates county, Missouri, to Missouri Valley Bridge & Iron Co., Leavenworth, Kans.
210 tons, state highway bridge, Pikeville, Ky., to R. C. Mahon Co., Detroit.
170 tons, bridge NRS 403-A, Algood Clay county, Texas, to Nashville Bridge Co., Nashville, Tenn.
150 tons, switch rack, specification 1553, Los Angeles, to Emsco Derrick & Equipment Co., Los Angeles.
150 tons, state bridge, Americus, Ga., to

Virginia Bridge & Iron Co., Roanoke, Va.

145 tons, balcony, trade school, Ford Motor Co., Dearborn, Mich., to Whitehead & Kales, Detroit.

135 tons, transmission towers, Appleton, Wis., for Wisconsin-Michigan Power Co., to American Bridge Co., Pittsburgh.

135 tons, 160-foot high truss bridge, Shawano county, Wisconsin, to Midland Structural Steel Co.

128 tons, bureau of supplies and accounts, navy department, for delivery to several yards for destroyers to Ross Galvanizing Co., Brooklyn, N. Y.

125 tons, construction bridge, Coulee dam, Washington, to Pacific Car & Foundry Co., and Isaacson Iron Works, Seattle.

120 tons, state highway bridge, Ulster county, New York, to Harris Structural Steel Co., New York; through Johnson, Drake & Piper Inc.

105 tons, shapes and bars, bridge, route 10, section 5, near Succasunna, N. J., shapes to American Bridge Co., Pittsburgh; 30 tons of bars to unstated fabricator; George M. Brewster & Son Inc., Bogota, N. J., general contractor.

100 tons, Nizina river bridge, Alaska, for Alaska road commission, to unnamed interest.

100 tons, tunnel ribs, metropolitan water district, Los Angeles, specification M-2322, to Commercial Shearing & Stamping Co., Youngstown, O.

100 tons, bridge, Barnesville, O., to Burger Iron Co., Akron, O.

100 tons, factory building, Tannen Corp., Wilmington, Del., to Morris Wheeler & Co., Philadelphia.

Shape Contracts Pending

5100 tons, shapes, plates and piling, Muscatine, Iowa, dam, Central Engineering Co., Davenport, Iowa, awarded general contract at $2,053,130.

5100 tons, including 2800 tons piling, dam, Guttenberg, Iowa; bids to United States engineers, Rock Island, Ill., Jan. 9.

3250 tons shapes and piling temporary bridge, Tygart's river dam, Grafton, W. Va., Frederick Snare Corp., New York, general contractor.

3000 tons, sheet piling, Government island, Calif., bulkhead; bids opened.

2800 tons, including 1300 tons piling, dam, Winona, Minn.; United Construction Co., Winona, low for general contract. McClintic-Marshall Corp., Bethlehem, Pa., low for fabricating steel.

2300 tons, Hall of Records, Oakland, Calif.; Pacific Coast Steel Corp., San Francisco, low on segregated bid.

1850 tons, specification 77, metropolitan water district, Los Angeles, Monrovia and Pasadena tunnel; bids opened.

1700 tons, 15 state highway bridges, Georgia; bids in Dec. 21.

1500 tons, bridge, Ottumwa, Iowa; Wisconsin Bridge & Iron Co., Milwaukee, low. Schneider & Johnson, Humboldt, Iowa, and Weldon Bros., Iowa Falls, Iowa, jointly low on general contract for alternate concrete design requiring 600 tons of shapes.

1400 tons, state highway bridge, Salisaw, Ark.; bids taken.

1290 tons, bridge, Hampton boulevard, Norfolk, Va.; bids Jan. 15 to Walter H. Taylor, director of public works.

1000 tons, gantry crane, Mare Island, Calif., navy yard; bids soon.

575 tons, bridge, St. Louis.

500 tons, bridge, Vinton, Iowa.

500 tons, state bridge, route 23, section 12-C, Pequannock, N. J.; bids Dec. 27.

475 tons, eight bridges, Nebraska.

475 tons, bridges, Cedar Falls and Bristol, Wis.; bids Dec. 28.

400 tons, bridge, McCarthy, Alaska.

375 tons, bridges, Missouri.

350 tons, addition, public school 80, Bronx, N. Y.; bids in Dec. 21.

330 tons, three bridges, Illinois; bids Jan. 4.

302 tons, Feather river bridge, Plumas county, California, for state; bids opened.

300 tons, bridge, Menominee, Wis.; bids Dec. 28.

200 tons, plant addition, Celanese Corp., Cumberland, Md., Hughes, Foulkrod Co., Philadelphia, awarded general contract; 430 tons for another section, bids opened but no award made.

200 tons, two locomotive cranes, Mare Island, Calif., navy yard; bids soon.

180 tons, bridges, Kenosha, Wis.; bids Dec. 28.

165 tons, state bridge, route 739, Armstrong county, Pennsylvania; general

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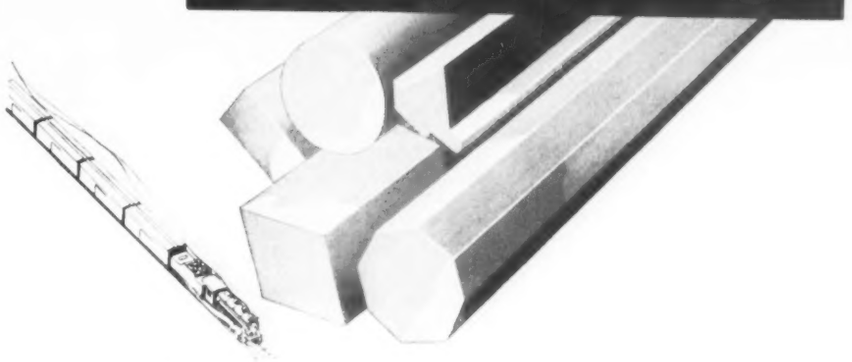

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contract to F. E. Trimpey & Sons, Casselmen, Pa.

164 tons, railroad overhead bridge, Chester county, Pennsylvania; bids to state department of highways, Harrisburg, Pa., Jan. 4; included 31 tons of plain steel bars.

160 tons, state bridge, Westbrook, Me.

150 tons, head gates and racks, Lockport, Ill., for Chicago sanitary district.

140 tons, special tees, delivery Portsmouth, N. H., and Mare Island, Calif., navy yards, for submarines now building, Bethlehem Steel Co., Bethlehem, Pa., low, bids Dec. 18, schedule 3965. Portsmouth delivered, $8566.80; Mare Island delivered, $4178.10.

119 tons, 1750-foot through truss bridge, South Buffalo township, Armstrong county, Pennsylvania; F. E. Trimpey & Sons, Casselman, Pa., low on general contract at $39,470. Included, 44,291 pounds of plain steel bars.

117 tons, Kings river bridge, Fresno county, California, for state; bids opened.

105 tons, shapes and bars, bridge, near Succasunna, Morris county, New Jersey; George M. Brewster & Son Inc., Bogota, N. J., general contractor.

101 tons, 1251-foot plate girder bridge, Ligonier township, Westmoreland county, Pennsylvania; Sheesley & Janney Construction Co., Johnstown, Pa., low at $42,994. Included, 49,638 pounds of plain steel bars.

100 tons, Nizina river bridge, Alaska; bids in.

100 tons, state bridge, route 302, Westmoreland county, Pennsylvania, general contract to Sheesley, Janney Construction Co., Johnstown, Pa.

Unstated, 266-foot swing span, Bonneville dam, estimated at $55,000; bids to United States engineer, Portland, Oreg., Dec. 28.

Reinforcing

Reinforcing Bar Prices, Page 47

Pittsburgh—Last week, Frederick Snare Corp., New York, was formally awarded the general contract for the construction of the Tygart river dam, near Grafton, W. Va., requiring about 1000 tons of rail steel reinforcing bars. Arundel Corp., Baltimore, is low for the general contract for an Atlanta, Ga., housing project which takes 1000 tons of bars. The market holds at 2.05c, base Pittsburgh, for reinforcing bars in cut lengths.

Cleveland—Bids will be taken on 1000 tons of reinforcing bars for the Muskingum, Ohio, conservancy district, Jan. 7, by the United States engineers, Zanesville, O. Other public projects in Ohio are absorbing only small lots, and private work is lacking. Several small purchases have been made for road work in Summit, Geauga and Trumbull counties, Ohio.

Chicago—Largest reinforcing bar tonnages in awards and inquiries are for river dam work. For the Muscatine, Iowa, dam, 1200 tons have been placed. Plans have yet to be issued for the Alton, Ill., dam but this work is expected to be started early next year and will require a large bar tonnage. About 1200 to 1500 tons of bars, it is estimated, will be purchased by general contractors for Illinois road work. Private construction still is slow and large orders for such work are lacking.

Boston—New requirements include approximately 300 tons for Rhode Island and Massachusetts highways. Small orders are fairly numerous. Pending bridge requirements in the New England district approximate 600 tons.

New York—While bids are in on approximately 1650 tons for New Jersey highways and bridges, little has been placed and a considerable proportion may not be bought until after Jan. 1. Several hundred tons of mesh and bars also have been bid for New York state highways. Awards are light and new inquiry small. Prices are unchanged.

Philadelphia — Reinforcing bar tonnage is negligible, although sellers expect specifications soon for the naval aircraft factory here, requiring about 400 tons, in addition to a substantial tonnage of structural steel. Billet steel bars are unchanged at 2.34c, Philadelphia, cut lengths.

San Francisco—Bookings were the lowest for any week of the year, less than 200 tons being placed. Bids have been opened, however, on several projects involving more than 12,000 tons. Outstanding among these were 7415 tons for the metropolitan water district, Los Angeles, and 3250 tons for contracts No. 15 and No. 15-A, San Francisco-Oakland bridge, San Francisco. Over 1200 tons for the George Washington school, San Francisco, still is pending.

Seattle—Bureau of roads, Portland, Oreg., will open bids Feb. 4 for a 3-span reinforced concrete bridge in Mount Rainier reserve involving 100 tons reinforcing and 15 tons of shapes. J. H. Stemmer, director of highways, announces Idaho has $532,000 available for road building including a sizeable bridge near Kooskia.

Concrete Awards Compared

	Tons
Week ended Dec. 22	1,618
Week ended Dec. 15	3,162
Week ended Dec. 8	2,230
This week in 1933	2,685
Weekly average for 1933	3,232
Weekly average 1934	4,112
Weekly average, November	1,695
Total to date, 1933	192,453
Total to date, 1934	213,831

Reinforcing Steel Awards

1200 tons, dam, Muscatine, Iowa, to Inland Steel Co., Chicago; Central Engineering Co., Davenport, Iowa, general contractor.

165 tons, Panama, to Dudley Bar Co., Birmingham, Ala.; $9373.50, delivered, schedule 3016, bids Dec. 11.

150 tons, highway, Ulster county, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Johnson, Drake & Piper Inc.

103 tons, bridge and approaches, Norwood, Mass., to Truscon Steel Co., Youngstown, O.; Simpson Bros. Corp., Boston, general contractor.

Reinforcing Steel Pending

6000 tons, specification 77, metropolitan water district, Los Angeles; bids opened.

2125 tons, contract No. 15, San Francisco-Oakland bridge, San Francisco; bids opened.

1250 tons, dam, Muscatine, Iowa; Central Engineering Co., Davenport, Iowa, awarded general contract at $2,053,130.

1415 tons, specification M-2033, metropolitan water district, Los Angeles; bids opened.

1125 tons, contract No. 15-A, San Francisco-Oakland bridge, San Francisco; bids opened.

1000 tons, Muskingum, O., conservancy district; bids Jan. 7 to United States engineers, Zanesville, O.

1000 tons, Atlanta housing project; Arundel Corp., Baltimore, low on general contract.

1000 tons, Iowa state highway bridge, Ottumwa, Iowa.

1000 tons, rail steel bars, Tygart river dam near Grafton, W. Va., Frederick Snare Corp., New York, awarded general contract last week at $6,305,773. Work on this project will be started within ten days.

1000 tons, Savannah, Ga., housing project; J. Jones, Charlotte, N. C., low.

930 tons, Hall of Records, Oakland, Calif.; MacDonald & Kahn, Oakland, Calif., low on general contract.

450 tons, bright ungalvanized wire strand, United States engineer, Memphis, Tenn., Dec. 28; also several hundred tons of twist and anchor wire, both of noncorrosive material.

405 tons, state bridges, Jefferson county, Alabama; bids in Dec. 22.

508 tons, dams for Santa Clara water conservation district, San Jose, Calif.; bids opened.

395 tons, state bridges and highways, Texas; bids in Dec. 19.

310 tons, dam, Winona, Min.; United Construction Co., Winona, low for general contract.

200 tons, Visitation valley school, San Francisco; bids rejected.

200 tons, Park school, San Francisco, Calif.; bids Jan. 23.

125 tons, bridges, Kenosha, Wis.; bids Dec. 28.

100 tons, 3-span bridge, Mt. Rainier reserve, Wash.; bids by bureau of roads, Portland, Oreg., Feb. 4.

Unstated, state bridge near Kooskia, Idaho; funds available, bids soon.

Strip Steel

Strip Prices, Page 47

Pittsburgh—Contrary to usual situation at the end of December, strip steel producers last week had good backlogs for both immediate and January shipment. Probably 50 per cent or more of these backlogs are traceable to automotive buyers. There will be no extended shutdown of strip steel producers' mills the coming week with holidays confined to a day or two at most. The market is unchanged at 1.85c, base Pittsburgh, for hot-rolled strip and 2.60c, Pittsburgh or Cleveland, for cold-rolled.

Cleveland—Further improvement in specifications from automobile manufacturers last week lifted strip mill operations here 15 points to 65 per cent. All orders are for prompt shipment. Miscellaneous buying also has improved.

Chicago—Strip demand is improving, due principally to a more substantial gain in automotive needs. While little change is noted in demand from miscellaneous consumers, sales and specifications at least are holding their own. Low inventories have contributed to steady demand from most consumers recently. Except in the automotive industry, forward buying has been limited.

Boston—Strip buying tends to be more spotty with slight change in rolling operations. Narrow widths are most active, with small orders leading. Automotive part producers have increased buying. Prices on both hot and cold-rolled are unchanged.

New York—While strip specifications probably will be restricted until after the holidays, the low volume of consumer stocks causes sellers to look for improved activity. A large manufacturer of electrical devices is expected to transfer production from the Midwest to Bridgeport, Conn., early in the new year. Prices are steady.

Philadelphia—Strip buying is slow but December has shown some improvement over November. The market is steady at 2.14c, Philadelphia, for hot strip and 2.89c, for cold strip.

Wire

Wire Prices, Page 47

Pittsburgh—Fairly heavy buying of wire rods against the application of the "common" and "combination" description which becomes effective on Jan. 1 shipments has featured the market on wire products. For users of round rods from 15/32-inch to 47/64-inch diameter, this change means an advance of $2 a ton, as combination wire rods were recently named at $40, Pittsburgh.

Cleveland — Manufacturers' requirements have expanded substantially, as mill specifications for immediate shipment have increased, despite a tax of about 2.75 per cent on inventories at the close of the year. Buying has developed from many directions, except for the jobbing trade, which is fairly well stocked.

Boston—Incoming wire business has held well to the volume of recent weeks, although orders have not been sufficient to materially change drawing operations in most departments. Demand has been fairly well

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spread, although rope has lagged slightly. Small orders predominate, but such orders, notably from New England, are fairly numerous.

Chicago—Aided by more liberal automotive releases, wire demand shows further improvement. Miscellaneous consumers are disposed to postpone forward buying and generally are taking material only for immediate needs. Jobber commitments continue limited.

Philadelphia—Sellers of manufacturers' wire look for substantial improvement after inventory season. Specifications for several weeks have been light, with a result that stocks at most consumers' plants are low.

Washington—Large quantities of wire fabric, strand and other wire products for various federal projects are active. The United States engineer, New Orleans, closes Dec. 26 on 1,590,000 square feet of galvanized wire fabric, six feet wide, in rolls of 6000 square feet. This fabric is to be of No. 12 gage wire with a 4x2-inch mesh, schedule 35-331-1. The army engineer at Memphis, Tenn., closes Dec. 28 on 450 tons of bright ungalvanized wire strand, 1,200,000 preformed noncorrosive twist wires, 250,000 preformed twist wires, 600,000 linear feet noncorrosive anchor wire and other wire material for use in the Memphis engineering district.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 47

Specifications on fourth quarter contracts for nuts and bolts at 70-10-10-10 off list were heavy during the week, as the price for first quarter recently was advanced to 70-10-10 off. Large rivets continue at 2.90c, Pittsburgh or Cleveland, and small rivets at 70-5 off list. Owing to increases in heavy melting steel scrap prices, averaging some $3 a ton, the wrought washer industry is considering an advance from the present discount of 6.00 off list at basing points at Pittsburgh, Chicago and Philadelphia. This may take effect for first quarter.

Eleven bidders quoted identical bids on 115,500 pounds of rivet steel for delivery to the Norfolk, Va., navy yard, Dec. 14. Bureau of supplies and accounts, navy department, closes Jan. 4 on 155 tons of rivets for delivery at Philadelphia for the cruiser WICHITA, now building.

Cold Finished

Cold Finished Prices, Page 47

Pittsburgh—Cold-drawn bar specifications are holding up well with numerous buyers entering orders for shipment in January. December has seen probably more agricultural implement buying in the cold-finished bar market than in any month of the past three to four years. The present market of 2.10c, Pittsburgh, is steady and unchanged.

Tin Plate

Tin Plate Prices, Page 46

Pittsburgh—Because of a sharp increase by several independent tin plate producers the average of operations in the district advanced 5 points last week to 50 per cent. The leading interest had schedules at 53 per cent, while at least two independents in the Pittsburgh district advanced their schedules to about 65 per cent. Tin plate buying continues to come in large measure from domestic canmakers. A refiling will be necessary on tin plate strips and waste-waste tin plate owing to failure of the original filing reported last week to have adequately described both products.

Billet specifications, especially forging quality, are being driven in by the understanding that new cutting extras are being considered and will be announced soon. In wire rods a number of specifications are being placed in view of the setup effective Jan. 1 whereby some sizes of wire rods to be known as "combination" have been advanced $2 a ton to $40, base, Pittsburgh or Cleveland. The movement of semifinished steel for the nonintegrated sheet and tin plate rollers has been advancing sharply. Practically no change is noted in demand for skelp or tube rounds.

New York—Recognition by the American Iron and Steel institute of two tin plate classifications, waste waste tin plate and tin plate strips, is revealed in prices and definitions recorded for the first time, effective Dec. 14. Waste waste tin plate is 2.75c, Pittsburgh, and 2.85c, Gary, Ind., and tin plate strips 2.50c, Pittsburgh, and 2.60c, Gary. Prices have been a matter of individual negotiation.

Waste waste tin plate must be packed in boxes weighing approximately 200 pounds, each to contain mixed sizes and mixed weights. The sizes must be within a range of 10 x 10 inches to 14 x 20 inches, in two weight classifications, 107 pounds and lighter, and 108 pounds and heavier. Tin plate strips must be packed in boxes of approximately 200 pounds, not less than 2 inches and not more than 4 inches wide, and 10 inches and longer. Each box must contain mixed weights, except that they will be classified in two base weights, 107 pounds and lighter, and 108 pounds and heavier.

Little production tin plate has been purchased for first quarter. Leading canmakers still are working on stocks.

Pig Iron

Pig Iron Prices, Page 48

Pittsburgh—Less-carload pig iron orders continue to improve but the market still lacks important buying. Sellers are shipping from stocks, as there are no merchant furnaces here or in the valley in operation. Bids on castings, gate valves, gate boxes and fire hydrants are asked by the city controller, Pittsburgh, until Dec. 28. Melters continue to buy on the basis of $18.50 per ton, Neville Island, for foundry pig iron, $19 for bessemer and $18 for basic grades.

Cleveland—Sales and shipments are mounting rapidly as melters obtain material for improved production early next year. Some consumers have covered estimated requirements for the entire first quarter. The agricultural implement industry is preparing for an exceptionally good year. The advance in scrap has led some consumers to contract. Automotive foundries are taking larger tonnages.

Chicago—Pig iron shipments show unusual resistance to the downward trend usually apparent during December, and it is expected that deliveries this month will be heavier than during November. Foundry operations, while affected seasonally in some instances, are fairly steady, necessitating heavier shipments than had been estimated earlier in the month. Automotive requirements are expanding steadily. The market continues $18.50, furnace, for No. 2 foundry and malleable.

Boston—Pig iron shipments are light and in small lots, although total volume this month will be slightly ahead of November. Little actual covering has been done for the first quarter. More foreign iron is arriving in New England, some Indian iron having been sold before arrival, while additional material is for storage.

Washington—Bids close Jan. 8 on 155 tons of foundry pig iron, delivery Charleston, S. C., and Puget Sound, Wash., bureau of supplies and accounts, navy department.

New York—Beginning with the latter part of last week pig iron specifications tapered off sharply, with little real activity expected now

until after the turn of the year. Some fair-size inquiries, however, are before the trade, but none involving more than a few hundred tons, so far as can be learned.

Philadelphia—Shipments of at least one large producer have about paralleled those of November, and while the current week is not expected to be productive of much business, an improvement should set in, sellers believe, after the inventory period. Except for certain larger consumers, notably pipemakers, general consuming stocks are low. Prices are steady.

Buffalo—Sellers here anticipate an active market for pig iron in the first quarter although present sales and inquiries are limited to the usual year-end small lots. Shipments are 50 per cent larger this quarter than in the third quarter.

Cincinnati—Shipments of pig iron have continued close to recent levels, almost all material going for urgent needs. Melters are aiming for low inventories, and an upturn in commitments next month is expected. The melt of automotive foundries is gaining.

St. Louis—Purchasing of pig iron mainly in small lots for prompt delivery, represents a substantial tonnage in the aggregate. Shipments so far this month indicate a continuance of the steady increase which began early in the fall. Inquiries for first quarter of 1935 have been in fair volume, and some business has been closed.

Birmingham, Ala.—With the two large blast furnaces of the Tennessee Coal, Iron & Railroad Co. at Fairfield producing, the pig iron output in the district for December will show an increase over November.

Toronto, Ont.—Demand for pig iron shows sharp falling off and melters are disinterested in purchasing. No booking has been reported for first quarter. Production, however, is holding at a steady rate in excess of 1000 tons per day. Prices are firm.

Metallurgical Coke

Coke Prices, Page 47

Although coke code authorities have not determined officially upon beehive prices for January, every indication last week was that present prices would be extended, $3.85 per ton for furnace coke, and $4.60 on common foundry grades, Connellsville, Pa., base. Premium foundry coke shows no signs of changing from the present range, finding some sellers naming $5.10 per ton and others, $5.35.

Present buying at Pittsburgh is made up of some fair orders for domestic heating grades, but generally the metallurgical grades represent only small hand-to-mouth purchases.

At Chicago foundry coke shipments are 10 to 15 per cent heavier than in November. Prices are unchanged, with no announcement for January. Birmingham, Ala., cokemakers continue production at a steady pace with no change in price.

Scrap

Scrap Prices, Page 49

Pittsburgh—The steel and iron scrap market has lost its briskness and most mills here indicate they are out of the market until after Jan. 1. Consequently, brokers with short orders have dropped their buying prices, but there has been no development to alter a consumers' buying range of $13 to $13.50 on No. 1 heavy melting steel. Only in specialties, where the district's two leading consumers withdrew from buying, was there any noticeable weakness.

Cleveland—Steel and iron scrap are quiet, shipments on contracts being the principal activity. Holders of scrap are not ready to release tonnage at present prices, in spite of the recent advance. Prices are unchanged.

Chicago—A sale of No. 1 heavy melting steel at $11 advances the market another 25 cents to the highest level in seven months. Most other grades also are quoted higher and dealers find it difficult to pick up sufficient old material, particularly railroad grades. Steel specialties, malleable scrap and other railroad materials are in light supply.

New York—Activity in scrap has subsided slightly, but without weakness in prices. Dealers are taking additional export commitments cautiously in view of the stronger domestic market. For boat loading prices are unchanged, but material is coming out less freely. Pittsburgh consumers have taken additional shipments of turnings from this district for which dealers are paying $1.75 to $2, f.o.b. cars, mainly in northern New Jersey.

Boston—Following advances on eight grades, further increase in scrap prices were made last week, including iron car wheels, forge flash-

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ings and forge fire, skeleton and shafting, the latter up 50 cents to $11.75 to $12.00, shipping point. Close to $7 has been bid for No. 1 melting steel for outside shipment to the Pittsburgh district. This has had a tendency toward firmer export prices, dealers reported to have paid better than $8.25, dock, for No. 1 melting steel and over $7 for No. 2. New England consumers are not following the rise. Within the last two weeks close to 15,000 tons has been loaded for export at Portland, Me.

Philadelphia—While the major grades of steel and cast scrap are unchanged, there being little new business to test the market, advances have been made in certain minor grades, based mostly on sales. These grades include knuckles and couplers, rolled steel wheels, specification pipe, axle turnings and machine shop turnings. Export prices are tending upward, with a 25 cent increase having been made in some cases on No. 1 and No. 2 steel. Momentarily export prices on these grades are $9.75 to $10, wharf, for No. 1 and $8.75 to $9 for No. 2, but it is believed that the top figures will become general shortly.

Baltimore—The leading domestic consumer here has purchased a small tonnage of No. 1 steel for Sparrows Point, Md., at $9.50, an increase of 50 cents a ton over the last preceding purchase.

Buffalo—District dealers are buying scrap readily in anticipation of heavy demand after Jan. 1. These purchases are fixing higher prices but so far no tonnage sales have been made to consumers.

Detroit—While scrap prices are unchanged, the tone of the market is a shade easier as the result of a sharp increase in production of old material by automobile plants. This development has relieved the tension previously existing due to scant supplies of scrap, but so far has failed to be reflected in consumers' prices.

Cincinnati—Iron and steel scrap moved higher during the past week in tardy sympathy with strength in nearby markets. Dealers were anxious for material, on speculation, and buying prices were increased 50 cents on most grades.

St. Louis—While purchasing by consumers has been practically absent, great interest centers in the iron and steel scrap market. Mills are strenuously resisting recent advances, but with supplies light are gaining no concessions.

Seattle—The scrap market has not responded to influences which advanced prices in the East, due largely to the fact export demand and not local consumption regulates the market. Domestic buying is small. The export situation is unchanged, good No. 1 steel ranging from $8.75 to $9, rails $10.50 to $10.75.

Birmingham, Ala.—Some added strength is evident in steel and iron scrap prices, though most quotations are unchanged. Most melters have moderate stocks.

Toronto, Ont.—Trading in iron and steel scrap is slow. Steel mills are out of the market. A few orders for iron scrap were closed during the week, but consumers are not taking large lots or placing orders for future delivery.

Ferroalloys

Ferroalloy Prices, Page 48

Books were opened Dec. 17 for first quarter contracting at unchanged prices for ferrochrome, ferrosilicon, silicon-zirconium, silico-spiegel silicon briquets, chrome briquets, ferro-vanadium and manganese briquets. Prices have also been reaffirmed on silicomanganese, and ferro-titanium high carbon 6 to 8 per cent. Low-grade carbon ferro-titanium, 3 to 5 per cent carbon, has been advanced to $142.50, a net ton in carlots, producers' plants, freight allowed.

While currently affected by holiday influences, ferromanaganese specifications this month probably will be the heaviest of the entire last half. Prices are firm at $85, duty paid, Atlantic and Gulf ports. Domestic speigeleisen, 19 to 21 per cent, also will show a gain for the month, with prices steady at $24, furnace, on lots up to 50 tons, and $26 on 50 tons and over.

Iron Ore

Iron Ore Prices, Page 48

Cleveland—Lake Superior iron ore producers have been denied an 18 per cent reduction in the $200,000,000 valuation for 1934 on their properties in St. Louis county, Minnesota, by the state tax commission. Two months ago the mining companies which contested the assessments on some mines in the county, embracing most of the Mesabi range, won an 18 per cent reduction on delinquent taxes for 1932 in circuit court. The tax commission refused to apply this to 1934 assessments pending a decision by the state supreme court in the tax suit.

No inquiries for iron ore for 1935 have appeared in the market, and prices are not being discussed. The Lake Superior Iron Ore association reports the following:

	Tons
Consumed in October	1,306,477
Consumed in November	1,298,404
Decrease in October	8,073
Consumed in November 1933	1,460,037
On hand at furnaces Dec. 1, 1934	30,625,105
On Lake Erie docks Dec. 1, 1934	5,248,555
Total at furnaces and Lake Erie docks Dec. 1, 1934	35,873,660
Total Dec. 1, 1933	36,199,710

New York—Chrome ore prices are tending upward, with the market now $18 to $18.50, c. i. f. gross ton, on 48 per cent material. More than 7200 tons arrived about the middle of this month at Philadelphia. Reliable advices are that a leading Turkish producer will have shipped more than 85,000 tons this year, a substantial portion going to the United States. Manganese ore continues strong.

Coke By-Products

Coke By-Product Prices, Page 47

New York—Current shipments of distillates are down seasonally, but contracting for part of next year at unchanged prices continues. Phenol demand is unchanged. Spot shipments of naphthalene and sulphate of ammonia are light, but contracting is fairly brisk with naphthalene releases expected about Jan. 15. Both flakes and balls are 5.50c, barrel lots.

Nonferrous Metals

Nonferrous Metal Prices, Page 48, 49

New York—Demand for nonferrous metals was lighter last week. While November statistics bolstered sentiment in the copper industry, they were depressing to zinc interests. Prices held steady.

Copper—Blue eagle sales declined to a daily rate of less than 500 tons. This compared with a rate of about 745 tons for the week ended Dec. 15. December bookings to date, however, totaled about 12,000 tons, or within less than 3000 tons of equaling the allocated sales of November. Statistics showing that world refined stocks were reduced about 13,900 tons during last month were considered a favorable factor in the market and increased optimistic feeling in the trade. Prices were again unchanged on the basis of 9.00c, Connecticut, for electrolytic.

Lead—Prices moved to 3.70c, New York, Monday on a buying wave that had carried quotations up $2 a ton on the preceding Friday. Light to

moderate trading was done on and after Wednesday for the balance of the week. Buying was well diversified among the various classes of consumers. The expected increase of domestic refined lead stocks during November was reported at 2650 tons and had no apparent effect on prices.

Zinc—Prime western prices ranged from 3.72½c to 3.75c, East St. Louis, during the week, closing on the basis of the former level. Some sellers were reluctant to do business on the lower level and indicated that a price rise may be effected by the close of the year. November statistics were unfavorable, however, and are causing concern among informed members of the trade.

Tin—Straits demand was light with prices comparatively steady and fractionally below the 51.00-cent level. Tin plate operations are reported slightly better at around 45 per cent of capacity. A large increase in world output was reported for November.

Aluminum — Demand continues quiet with prices steady. Ninety-nine per cent metal was available at 19.00c. Secondary ingots were strong and quoted higher.

Antimony—Prices were nominally 13.75c for spot, generally untested.

Warehouse

Warehouse Prices, Page 50

Pittsburgh — Because small-lot quantity extras on plates and shapes which mills had planned to adopt Jan. 1 and which were recently postponed until March 1, would have helped jobbers only in lots of 1000 pounds and less, the latter group are not much disappointed at the delay. December warehouse bookings and shipments are below November's.

Cleveland—The undertone of the market is much better than in several weeks. Some sellers report the number of orders and tonnage this month will exceed those of November.

Chicago—Business is moderately less active than during early December. While a further recession during the holiday period is in prospect, the month's volume is expected to be favorable.

New York—Warehouse volume has held unusually well with most jobbers, the year-end drop coming much later than usual. Prices are generally steady with the exception of bolts and nuts, which in this district continue erratic.

Philadelphia — Warehouse buying in this district is at a better rate than in the corresponding period in November. The usual holiday lull set in later this year than was expected, ered tardy.

Seattle—Volume is satisfactory considering the season. There is practically no mill buying. Prices are generally maintained. Sales are confined largely to public work, Coulee project calling for miscellaneous items. Sheets are in fair demand.

Equipment

New York—Awards continue to be made against the large list of machinery for arsenals on which bids are in. Most of the volume will be placed before the end of the year, contracts totalling over $2,000,000. Several dealers and builders in this district have booked considerable volume. While not yet out for figures, equipment for the large government aircraft plant, now building at Philadelphia, is being planned. Sales of one or two tools at a time to private industrial plants continue.

Boston—Operating schedules at several of the larger machine tool building plants are at the highest rate in months and the year-end suspension will be brief.

Pittsburgh—Pittsburgh Lectromelt Furnace Corp. here recently built a 20-ton furnace for the International Nickel Co.'s Huntington, W. Va., works, a duplicate of a furnace which the same builder shipped to International Nickel some time ago. The same firm recently sold 1½-ton electric furnaces of a similar design to both the Burd Piston Ring Co., Rockford, Ill., and the Rock Island, Ill., army arsenal.

Chicago — Miscellaneous demand for various types of metalworking machinery is holding better than usual for this period despite some hesitations attributable to seasonal influences. Business in machine tools, while relatively light, is regarded as fair, with inquiries and purchases under consideration indicating an improvement in orders next quarter.

Steel in Europe

Foreign Steel Prices, Page 50

London—(*By Cable*)— Great Britain's foreign trade in November showed a decrease of 16,114 gross tons in imports and a loss of 1021 tons in exports. Imports in November were 104,086 tons, compared with 120,200 tons in October; exports were 219,879 tons in November, and 220,900 in October.

Activity in the steel and iron markets is less as holidays and stock-taking time impend. Most producers have good forward contracts, and prospects for 1935 are favorable. Orders from South Africa and Argentina are improving.

The Continent reports export markets are dull. Poland has booked additional Russian orders. Activities of the Far East are increasing.

Wire

High Carbon—Low Carbon
Oil Tempered Wire
Flat—Round and Half Round
Straightened and Cut Wire
Welding Wire

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New York

BUFFALO—Great Lakes Furnace & Insulating Corp. has been incorporated to manufacture heating devices, by Julian H. Weiss, Brisbane building, Buffalo.

HERKIMER, N. Y.—Bishton Tool & Mfg. Co. Inc., recently organized, to manufacture reamers, is planning to start production soon in a factory located at 615 East German street.

NEW YORK—Standard Oil Co. of New Jersey, 26 Broadway, will soon let contracts for boilers and other equipment for reconditioning its burned Campana refinery in Argentine.

NEW YORK—A report by Maurice P. Davidson, commissioner of water supply, gas and electricity, City Hall, places the cost of a 75,000-kilowatt steam-turbine municipal power plant at $7,500,000 and a system of transmission lines at $101,400,000. A tentative promise of a PWA loan from the government has been received.

NISKAYUNA, N. Y.—Colonial Beacon Oil Co. Inc., 155 East Forty-fourth street, New York, will soon let contract for a bulk storage plant, warehouse, office and pump house, to cost approximately $85,000.

SYRACUSE, N. Y.—Canastota Mfg. Co. Inc. has been organized to manufacture metal castings and tools, by Russel E. Harrington, University block, Syracuse, N. Y.

Pennsylvania

NEW CASTLE, PA.—City will hold special election in January to approve bonds for $3,750,000 for new city-owned electric light and power plant. Preliminary plans are under way. (Noted Oct. 8).

Ohio

AKRON, O.—Johnson Steel & Wire Co., manufacturer of high carbon steel wire, is scheduled to start in production Feb. 1. The plant will operate in a large building formerly used as a warehouse by the W. E. Wright Co., and an addition will also be constructed.

CINCINNATI—City is planning to construct a pumping station to house new electric pumps at Western Hills station, to cost approximately $55,000, and will install electric pumps at a cost of $75,000. A. S. Hibbs, superintendent of waterworks.

CINCINNATI—Sun Oil Co., 1608 Walnut street, Philadelphia, will build landing facilities on the Ohio river here for unloading gasoline from river barges. In connection with unloading facilities, a 6-inch pipe line will be constructed to storage tanks.

CLEVELAND—Ohio Pipe & Supply Co., 14615 Lorain avenue, has a plant expansion program under way.

CLEVELAND—Triplex Screw Co., 5317 Grant avenue, is planning to expand its facilities.

CLEVELAND — United States Atmospheric Purifying Co., 2178 East Seventy-sixth street, manufacturer of smoke purifying equipment, is scheduled to start in production about Jan. 15. Apparatus is to be made in sizes for apartment houses, commercial buildings, factories, schools and boats.

CLEVELAND — Weinig - Made - Rite Co., manufacturer of electric toasters, electric fans and specialties, is planning to move its branch plant in Sandusky, O., to Cleveland. The Cleveland factory, previously located at 1814 East Fortieth street, has been moved to the Peerless Paper Box building, 10610 Berea road.

DAYTON, O. — William H. Focke Sons Co. is planning to construct an addition to its plant at an estimated cost of $20,000. Project will include a storage and shipping building.

LORAIN, O.—Plant of the American Stove Co. here, closed for four years, will open shortly after Jan. 1. Work on preparing the plant for operation will start immediately, at a cost of about $75,000 to $100,000.

MANSFIELD, O.—Dominion Electric Co., Minneapolis, W. H. McClelland works manager, is planning to establish a plant here after Jan. 1.

MARIETTA, O. — C. P. Hoover, sanitary and water engineer, 8 East Long street, Columbus, O., has made a preliminary survey for a filtration plant. Project will cost about $120,000. J. Morton Harper, mayor, is backing the project.

MANSFIELD, O.—Sun Glow Industries Inc., North Diamond street, manufacturer of furniture, has completed negotiations for a long term operating agreement with the Rudolph Wurlitzer Mfg. Co., North Tonawanda, N. Y., whereby it will have exclusive use of the Wurlitzer plant.

WOOSTER, O.—Cedar Valley Distillery is constructing a plant here.

Michigan

DEARBORN, MICH.—Ford Motor Co., construction department, is taking figures for furnishing and erecting structural steel for the trade school unit of the machine shop building.

DETROIT — Electro-Best Mfg. Co., Highland Park, has been incorporated by Albert J. Stone, 113 Belmont avenue, to engage in manufacturing.

DETROIT—Bissett Steel Corp., has been incorporated by L. A. Bell, 1109 Hippodrome building, Cleveland, to do die and specialty manufacturing.

DETROIT—Vickers Inc., LaSalle and Oakman boulevards, Fred J. Fisher, president, is building an addition which will triple the amount of floor space now occupied.

DETROIT—Walbridge Aldinger Co., 409 Griswold street, has been awarded the contract for a combined garage and machine shop building, to be erected in Detroit for the Ditzler Color Co., 8000 West Chicago avenue.

KALAMAZOO, MICH. — Sutherland Paper Co. is constructing an addition to its plant, 111 x 340 feet, costing $60,000.

KALAMAZOO, MICH.—Billingham & Cobb, Kalamazoo, Mich., architects, are preparing plans for construction of a combined court house and jail building in Kalamazoo for the county board of supervisors at an estimated cost of $750,000.

GRAND RAPIDS, MICH. — Grand Rapids Brewing Co. will spend $40,000 for remodeling a brewing plant in Muskegon, Mich. S. J. Goldberg, Muskegon, is taking figures.

Illinois

CHICAGO—National Steel & Copper Plate Co., 2012-20 Larrabee street, recently sustained damages by fire.

CHICAGO—Rock-Ola Mfg. Co., 625 West Jackson building, is planning to recondition the former Gulbranson piano plant for vending machine manufacturing, at a cost of about $30,000.

CHICAGO—Bell & Zoller, 307 North Michigan avenue, has placed a contract with the Robbins Conveying Belt Co., New York, for the design and construction of a coal washing plant to be built at the former's mines in Franklin county, Illinois. The work will cost about $600,000.

CHICAGO — Neil C. Hurley, president, and J. F. Roche, vice president, Binks Mfg. Co., 3106-50 Carroll avenue, have formed a new Canadian company to be known at the Binks Mfg. Co. of Canada Ltd., which will be located at Windsor, Ont. This new company will facilitate the rapidly increasing sale and service of Binks spray paint finishing systems and water cooling systems in Canada.

ROCHELLE, ILL.—City is preparing plans and will take bids early in 1935 for constructing a sewage treatment plant at a cost of $71,000. Suhr, Berryman, Peterson & Suhr, 130 North Wells street, Chicago, engineers.

Alabama

HAMILTON, ALA.—City has PWA allotment of $35,000 for constructing waterworks; will receive bids Jan. 3.

LINCOLN, ALA.—City will receive bids in January on waterworks system, costing $80,000.

Georgia

QUITMAN, GA.—Gulf States Cooperage Co., S. P. McDonald Jr., Tallapoosa, Ga., representative, has leased the Shore Lumber Co. plant for manufacturing barrel heads. The lease includes present mill site, buildings, dry kilns and yards, planing mill, boilers, etc. A change in equipment will be made.

Kentucky

ARLINGTON, KY.—City will take bids about Jan. 5 or 10 for waterworks system, including pumping house, pumps, tank on tower, distribution mains, etc. Fund of $38,000 has been allotted by PWA. J. S. Watkins, 610 Citizens Bank building, Lexington, Ky., engineer.

STAMPING GROUND, KY.—Buffalo Springs Distilling Co. has let contract to H. G. Graham, Frankfort, Ky., for 4-story warehouse, 60 x 100 feet, 10,000 barrel capacity.

Louisiana

ST. JOSEPH, LA.—Philip Watson, mayor, will call for bids in about two months for water softener and filtration plant and will install machinery necessary for plant. PWA loan has been approved.

Maryland

CHESTERTOWN, MD.—City will receive bids early in 1935 for sewers and disposal plant, costing $45,000. Whitman, Requardt & Smith, engineers, corner Biddle and Charles streets, Baltimore.

Tennessee

ALGOOD, TENN.—Town, S. D. Poteet, mayor, will take bids Jan. 4 for construction of waterworks. D. A. Switzer, Knoxville, Tenn., engineer.

KNOXVILLE, Tenn. — Tennessee Valley Authority has authorized the cities of Florence, Sheffield and Tuscumbia, Ala., to proceed with their

plans for constructing municipal electricity distribution systems.

Virginia

GRETNA, VA.—City has had loan and grant for water system increased to $63,000 and has revised plans to include a dam on Georgia's creek, pumping station, reservoir, filter plant and distribution system.

RICHMOND, VA.—Koiner Distilling Co., J. Lee Koiner, plans establishing distillery at Koiner Mills on Hermitage road.

Missouri

KANSAS CITY, MO.—Kary Canatasey, Canatasey Electric Mfg. Co., 514 Wyandotte street, manufacturer of electric transformers, has leased a building on the northwest corner of Seventh and Wyandotte streets for expansion of plant.

Texas

AUSTIN, TEX.—State highway department, Austin, Tex., plans three shop buildings at Camp Mabry, approximately 50 x 220 feet, to be of structural steel frame work. Gibb Gilchrist, state highway engineer.

PORT LAVACA, Tex. — City has submitted plans to PWA state board for refrigeration unit, cold storage plant and diesel power plant, including complete machinery equipment. Estimated cost $150,000. Garret Engineering Co., Port Lavaca, Tex., engineer.

Wisconsin

CAMPBELLSPORT, WIS.—Federal funds of $74,500 have been allotted village for construction of $58,000 waterworks and $60,000 sewerage system, to be built next spring. Jerry Donahue Engineering Co., Sheboygan, Wis., is working on plans.

MADISON, WIS.—Permanent Construction Co., 735 North Water street, Milwaukee, general contractor on $900,000 addition to Nine Springs municipal sewage disposal plant here, has sublet all crane and hoist equipment to Chisholm-Moore Hoist Corp., Tonawanda, N. Y.

MILWAUKEE — Milwaukee Electric Railway & Light Co. has approved plans for power substations at Port Washington and Saukville, Wis., and for addition to power substation at Granville, Wis.

TIGERTON, WIS. — Federal loan and grant of $50,000 has been made available to village for new waterworks plant. Druar & Milinowski, 500 Globe building, St. Paul, have plans in progress. Bids will be taken in March or April.

POTOSI, Wis.—Village voted to sell its municipal light and power plant to Interstate Power Co., Dubuque, Iowa, which will make considerable improvements to plant, install additional equipment and build new transmission line.

RACINE, WIS.—Dumore Co. has acquired a factory building at Fourteenth, Racine and Clark streets where it will move both its office and factory equipment. In addition to providing for future expansion, the new building and new equipment being purchased will offer unlimited opportunities for systematic and efficient production of motors, grinders and electric appliances.

WONEWOC, WIS. — Walter Blake Construction Co., Appleton, Wis., has general contract for remodeling and enlarging plant of Hamburg Brewing Co. here at cost of $85,000. Equipment purchases will start shortly.

Minnesota

DULUTH—City council has appropriated $1000 for an engineering survey for a proposed municipal heating system for the east end to cost $3,400,000.

MINNEAPOLIS — Northwestern Consolidated Milling Co., 1013 Metropolitan Life building, has awarded contract to H. N. Leighton Co., 716 South Seventh street, for alterations and repairs to 5-story flour mill, to cost about $25,000.

ST. PAUL—United States engineer office, 615 Commerce building, will receive bids until Dec. 28 for traveling tainter gate hoists for lock and dam Nos. 4 and 5 on the Mississippi river.

ST. PAUL—Farmers Union Terminal Co., 1300 Minnesota building, has awarded contract for construction of a $50,000 oil blending plant at South Park. Ellerbe & Co., 100 Minnesota building, architect and engineer.

WALNUT GROVE, Minn.—A. W. Olson, village clerk, will receive bids until Jan. 7 for material and fittings for extension of about 1230 feet of 6-inch water mains, also for extension of about 700 feet of 4-inch water mains.

Iowa

LAMONI, Iowa—Martin A. Hynden, town clerk, will receive bids until Jan. 8 for construction of municipal light and power plant to cost $100,000, including power house, cooling tower base, oil tanks, 2 diesel engines, electric generators and complete electrical distribution system.

CEDAR RAPIDS, Iowa—Penick & Ford Ltd., manufacturer of corn products, has awarded contract to John S. Metcalf, 111 West Jackson boulevard, Chicago, for construction of a 4-story workhouse, 62 x 160 feet, and 8 grain storage tanks to hold 500,000 bushels of corn, each tank being 107 feet high, to cost about $100,000. A. H. Lenders, vice president and general manager.

Kansas

FREDONIA, KANS.—City will hold an election Dec. 24 on waterworks system to cost $80,000.

Wyoming

GREEN RIVER, Wyo. — Sweetwater Brewery Inc. is planning to enlarge its brewery from 20,000 to 50,000-barrel capacity annually.

Pacific Coast

SPOKANE—Bohemian Brewing Co., 1402 West Second street, is building a concrete addition to its plant.

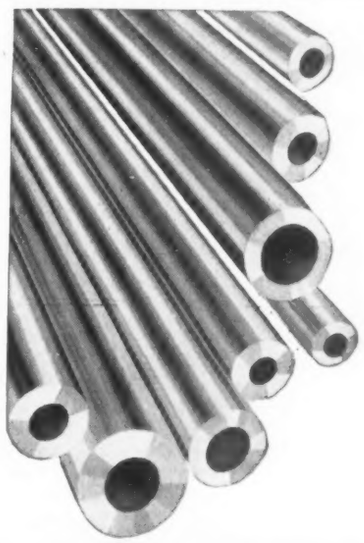
VANCOUVER, WASH.—Great Western Malting Co. Inc., recently formed with $350,000 capital by J. R. Bowles, is planning construction of a plant here to supply breweries in this area.

Dominion of Canada

MICHIPICOTEN ISLAND, ONT.—South Shore Gold Mines, D. S. Bird, chief engineer, Wawa Lake, Michipicoten Island, is planning electrification of plant and installation of additional equipment.

SAULT STE. MARIE, ONT.—Algoma Steel Corp. is inquiring for several bell-type electric furnaces.

WHITBY, ONT.—Canadian Boat Industries, J. Beecroft and W. H. Stevens, engineers, plans building and equipping plant, including shop, for construction of power cruisers and yachts. Estimated cost $75,000.



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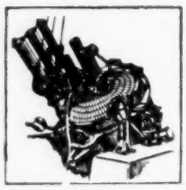
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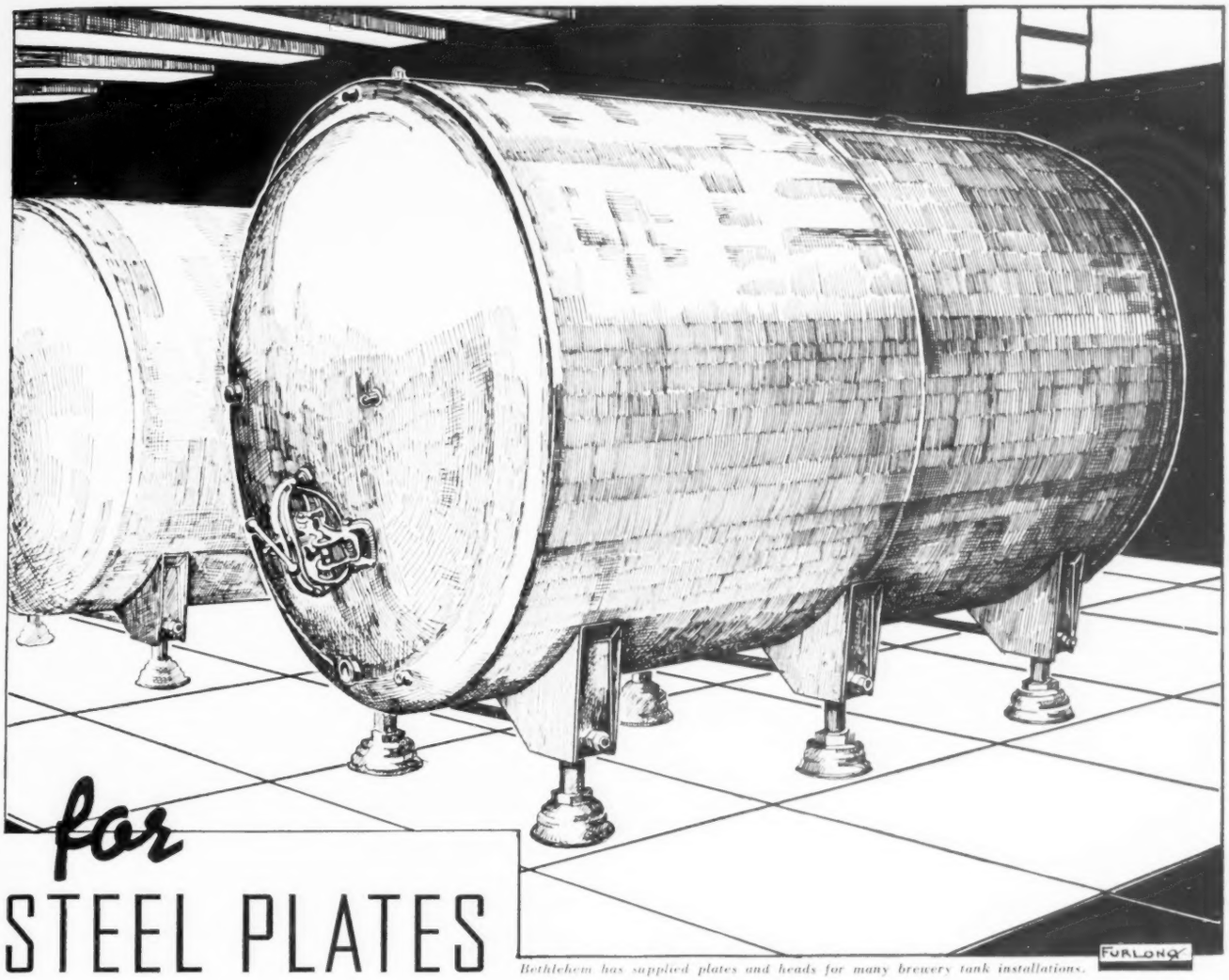

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